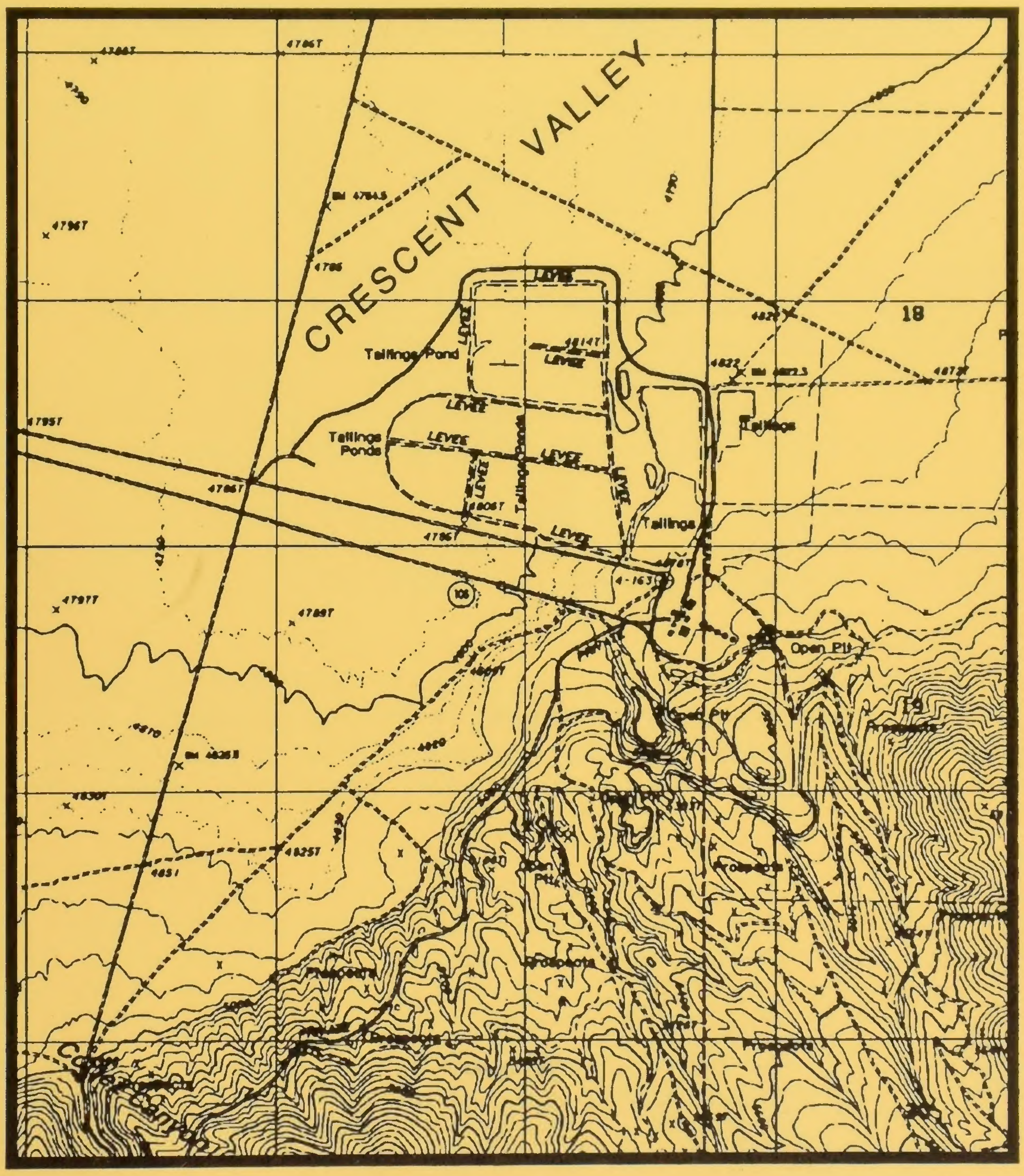
BLM LIBRARY
88045869

MARCH 3, 1849

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Battle Mountain District Office, Battle Mountain, Nevada **August 1993**

CORTEZ GOLD MINE EXPANSION PROJECT
Final Environmental Impact Statement


CRESCENT VALLEY
Tailings Pond
Tailings Ponds
LEVEE
Tailings
Open Pit
Prospects
18
19
105

COOPERATING AGENCIES:

Nevada Department of Conservation and Natural Resources
Division of Environmental Protection
Carson City, Nevada

MISSION STATEMENT

The Bureau of Land Management is responsible for the stewardship of our public lands. It is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people for all times. Management is based on the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include: recreation; rangelands; timber; minerals; watershed; fish and wildlife; wilderness; air; and scenic, scientific, and cultural values.

BLM LIBRARY
RS 150A BLDG. 50
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, CO 80225

BLM/BM/PL-93/010+1793

ID88045869 TN 423 .N3 B38 1993 c-2

United States Department of the Interior

TAKE PRIDE IN AMERICA

BUREAU OF LAND MANAGEMENT
Nevada State Office
850 Harvard Way
P.O. Box 12000
Reno, Nevada 89520-0006

IN REPLY REFER TO:
N64-87-010P
1790/3809
(NV-064.3)

JUL 19 1993

Dear Reader:

Enclosed is the Cortez Gold Mines Expansion Abbreviated Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) approving the Environmental Impact Statement (EIS) and the Plan of Operations (POO). These documents are for your review.

The abbreviated FEIS includes five comment letters and comments made at two public meetings on the Draft Environmental Impact Statement (DEIS). It also includes responses prepared by Bureau of Land Management (BLM) staff, Cortez Gold Mines personnel, and staff of the consulting firms of Woodward-Clyde and JBR Consultants, the third party contractors, to those comments.

This abbreviated FEIS and the DEIS constitute the complete EIS. The two documents must be used together for a complete understanding of the Cortez Gold Mines Expansion Project and the BLM's findings.

The decision reached in the ROD is subject to appeal to the Interior Board of Land Appeals. The thirty day appeal period starts with the publication of the Notice of Availability and the ROD by the Environmental Protection Agency in the *Federal Register*.

The Council on Environmental Quality Regulations (CEQ) normally require a thirty day waiting period between the issuance of the FEIS and the ROD. The FEIS and the ROD may be issued simultaneously with an exception to that regulation possible if other Federal regulations enable the decision to be altered during that thirty days. The BLM has instituted this exception to the waiting period, since the 43 Code of Federal Regulations 3809 provide such an opportunity.

You may direct comments or questions to Dave Davis, Cortez EIS Team Leader at the Bureau of Land Management, Battle Mountain District Office, 50 Bastion Road, P.O. Box 1420, Battle Mountain, NV 89820, or phone (702) 635-4000.

Sincerely,

Billy R. Templeton

Billy R. Templeton
State Director, Nevada

BLM LIBRARY
RS 150A BLDG. 50
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, CO 80225

RECORD OF DECISION

AND APPROVAL OF THE

PLAN OF OPERATIONS AMENDMENT FOR THE

CORTEZ GOLD MINES EXPANSION

N64-87-010P
N64-EIS2-36

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
BATTLE MOUNTAIN DISTRICT OFFICE
SHOSHONE-EUREKA RESOURCE AREA
P.O. BOX 1420
50 BASTION ROAD
BATTLE MOUNTAIN, NEVADA 89820

Billy R. Templeton

Billy R. Templeton
State Director, Nevada

DATE: 7/19/93

COOPERATING AGENCIES:

NEVADA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
CARSON CITY, NEVADA

SUMMARY OF THIS RECORD OF DECISION

Included in this Record of Decision (ROD) are the following:

The **DECISION** approves the findings of the Environmental Impact Statement (EIS) and approves Cortez Gold Mines' (Cortez) Plan of Operations (POO) Amendment.

The description of **ALTERNATIVES, INCLUDING THE PROPOSED ACTION, THE BLM'S PREFERRED ALTERNATIVE, AND THE ENVIRONMENTALLY PREFERRED ALTERNATIVE:** 1) briefly summarizes the Proposed Action and Alternatives considered, 2) identifies the Proposed Action as the BLM's "Preferred Alternative", and 3) identifies the "NO Action" or "No Project" alternative as the Environmentally Preferred Alternative.

The **PLAN OF OPERATIONS AND BOND** briefly describes the Bureau of Land Management's (BLM) and the Nevada Division of Environmental Protection's (NDEP) permitting and bonding process. It also identifies the bond amount Cortez has posted for its 428 acre expansion.

The **MANAGEMENT CONSIDERATIONS** identifies the BLM's management constraints and issues used in approving the project. Included in this is the Federal Land Management and Policy Act (FLPMA) requirement of ensuring that the proposed action complies with the Shoshone-Eureka Resource Area's Resource Management Plan (RMP).

The **MITIGATION AND MONITORING** section identifies the mitigation Cortez must implement in order to reduce environmental impacts that are anticipated to result from implementing the project. This section also identifies the monitoring that the BLM and Cortez will perform to ensure compliance with this ROD and the findings in the EIS.

Finally, the **PUBLIC INVOLVEMENT** section identifies the public involvement process the BLM used throughout the EIS process to ensure the public was fully involved in this EIS process.

DECISION

In June, 1990 Cortez of Cortez, Nevada, submitted to the Battle Mountain District, Shoshone-Eureka Resource Area of the BLM an amended POO for the proposed 1630 acre expansion of Cortez's existing gold mining operations. The BLM decided this project would require the preparation of an EIS as prescribed by the National Environmental Policy Act (NEPA).

During the interim period of preparing the EIS, Cortez discovered a significant new ore body while performing condemnation drilling operations. This discovery changed the economic direction of the mine. Cortez revised the submitted POO, reducing the scale of the proposed project from the original 1630 acres to 428 acres. The project area directly affected by the "new" proposed expansion is located in Township 27 North, Range 47 East, section 13; Township 27 North, Range 48 East, section 18; Township 28 North, Range 46 East, section 36; Township 28 North, Range 47 East, section 31; and Township 27 North, Range 46 East, section 1.

The BLM prepared an EIS to analyze the impacts of the proposed plan amendment. The Draft EIS was issued December 24, 1992. Comments on the Draft EIS were solicited and received by the BLM and integrated into an Abbreviated Final EIS (FEIS). The FEIS is being issued simultaneously with this ROD. Based upon the FEIS, it has been determined that the implementation of the POO, as modified by the Mitigation Measures described below, will not cause unnecessary and undue degradation to the public lands. This POO Amendment and the FEIS are hereby approved subject to the Mitigation Measures and Financial Assurances described in this Decision document. This Decision shall not be implemented by Cortez until 30 days following the date of publication of the Notice of Availability of the FEIS by the Environmental Protection Agency in the *Federal Register*.

ALTERNATIVES, INCLUDING THE PROPOSED ACTION, BLM'S PREFERRED ALTERNATIVE, AND THE ENVIRONMENTALLY PREFERRED ALTERNATIVE

The analysis of alternatives in the EIS included the Proposed Action and the No Action Alternative. The proposed project includes expanding existing open pit mines, expanding existing waste rock dumps, construction of new heap leach and tailings facilities, and further exploration. In addition, some changes to existing processing facilities are proposed, including raising the tailings dam of pond No. 6, and heap leach facilities expansion.

The expansion of existing facilities, the fixed location of ore reserves, and such aspects of the project as geotechnical requirements, depth to ground water, economies of mining disseminated gold reserves, and environmental concerns, all combined to limit the array of alternatives the BLM was able to consider and analyze in detail.

True "Alternatives" to the Proposed Action were limited for the above reasons. An array of "sub-alternatives" for facility locations was considered by the BLM and Cortez. A number of these were considered, but not analyzed in detail (Page 2-40, Chapter 2.4.2.1 of the Draft EIS) for several reasons, including those mentioned above. A full description and rationale used to eliminate these possible alternatives is presented in the Draft EIS. These alternatives included:

1) Alternative Locations for Project Facilities
2) Operational Alternatives
3) Sequential Filling of Existing Open Pits with Waste Rock

The Draft EIS also identified the BLM's "Preferred Alternative" [as required by 40 CFR 1502.13 (e)] as the "Proposed Action", including the proposed mitigation measures.

The Council on Environmental Quality (CEQ) Regulations for implementation of the NEPA mandate that the ROD for any Federal action must identify the "environmentally preferable" alternative. Since mining is, by its nature, disruptive to most of the resources in the immediate area being mined for the period prior to reclamation, none of the "action" alternatives is environmentally preferable. Rather, the "No Action" Alternative would result in the least disturbance to the environment.

PLAN OF OPERATIONS AND BOND

Effective October 1, 1990, the NDEP's regulations for reclamation and bonding for surface disturbance went into effect. The BLM, through a Memorandum of Understanding with the State of Nevada, implements its *Surface Management Regulations* (43 CFR 3809) in concert with these new State requirements.

Cortez has submitted an application for a reclamation permit to the NDEP and BLM for its proposed 428 acre expansion. The NDEP and the BLM have reviewed this application and found its content acceptable. Cortez has submitted to the Nevada State Office of the BLM a bond for $1,425,624 for surface reclamation of the project. This bonding level also provides for neutralization of all heap leach cyanide facilities associated with the proposed project. The BLM, in consultation with the State of Nevada, has determined that the bond amount is adequate for all aspects of the proposed project. Cortez has submitted, and the BLM is holding this bond surety, effective February 11, 1993.

This bond amount will be adjusted periodically by the Authorized Officer, as conditions warrant or when requested by Cortez, but not less frequently than every three years during the term of the project. Any adjustment will be based upon planned disturbance, present unreclaimed disturbances, reclamation costs and inflation.

Under the NDEP/BLM regulations, Cortez has filed a complete operating and reclamation plan and bond estimate for those remaining components of the facility, including all exploration work (i.e. all post January 1, 1981 disturbance; all cyanide facilities; all pre-1981 disturbance used after January 1, 1981). The BLM and the NDEP are currently reviewing this reclamation permit application for detail and review of the bond estimate calculations. Upon finalization of this review, Cortez is required to have an appropriate bond or other surety in place on or before October 1, 1993.

MANAGEMENT CONSIDERATIONS

The POO describes the expansion of an existing mining facility within an area of the BLM's Battle Mountain District. Mining in the area has been identified as an appropriate land use that conforms with the Shoshone-Eureka Resource Area RMP, dated March, 1986. Specifically, on page 29 in the ROD of the RMP, under the heading of "Minerals", sub-titled "Objectives", number 1:

> "Make available and encourage development of mineral resources to meet national, regional, and local needs consistent with national objectives for an adequate supply of minerals."

Also on page 29 of the of the above mentioned ROD, under "Management Decisions", number "1", "Locatable Minerals":

> "All public lands in the planning areas will be open for mining and prospecting unless withdrawn or restricted from mineral entry."

Also, Number "5", page 29 of the ROD, under "Current Mineral Production Areas" states:

> "Recognize these areas as having a highest and best use for mineral production and encourage mining with minimum environmental disturbance. Make thorough mineral examinations of all sites proposed for other Bureau programs in these areas."

Mining, by law, is a valid use of the Public Lands, which is inherently site specific and which does not lend itself to relocation.

Cortez's past and current operations at the Cortez, Horse Canyon and Gold Acres sites, historical operations, as well as several other mining operations by other companies in the same general vicinity have established mining as one of the principal land uses in the area in the near term. Cortez and its predecessors have been operating in the area since the 1960's. Cortez does not have a record of non-compliance with the terms of any previously approved plans of operations.

Approval of the POO will permit Cortez to utilize its existing workforce of approximately 180 personnel and its existing equipment and infrastructure to develop the proposed project. It may also facilitate the development of other nearby gold resources which were analyzed in Chapter 5.0, "Cumulative Impacts" section of the Draft EIS. Any such development may only occur following further amendment to the POO and environmental analysis.

The POO, including the reclamation plan bonding surety and mitigation measures, are adequate in the BLM's view, to minimize the adverse environmental impacts identified in the EIS and ensure that all practicable means to avoid or reduce environmental harm have been incorporated into the project. The monitoring requirements of the POO will assist Cortez, the BLM and others in identifying and mitigating or avoiding unforeseen environmental impacts that may occur. The BLM's review of amendments to this POO and future developments by Cortez in the area shall provide additional protection and periodic opportunities for the BLM to refine the analyses, decisions, and financial sureties contained in this Decision by: 1) the long-term monitoring and mitigation and 2) periodic review of the adequacy of Cortez's financial assurances.

Considering all pertinent factors, the BLM's Preferred Alternative provides for the systematic development of a minable resource in the least environmentally impacting manner. All practicable means to avoid or minimize environmental harm from the selected alternative have been adopted.

APPEALS

This Decision is subject to appeal pursuant to 43 CFR 3809.4. A third party that is adversely affected may file such an appeal in accordance with the procedures in 43 CFR Part 4 with the Interior Board of Land Appeals, Office of Hearings and Appeals, 4015 Wilson Blvd., Arlington, Virginia, 22203. An appeal shall be filed not later than 30 days after the date of service of the Decision or publication of notice of the Decision in the Federal Register. See 43 CFR Part 4.

Cortez Gold Mines has the right to appeal this decision to the Nevada State Director, Bureau of Land Management, in accordance with 43 CFR 3809.4. If you exercise this right, your appeal must be filed in writing, accompanied by a statement of reasons and any arguments you wish to present, which would justify reversal or modification of this decision. Your appeal must be filed with the Bureau of Land Management, Nevada State Office, 850 Harvard Way, P.O. Box 12000, Reno, Nevada, 89520-0006 within 30 days after the date of the receipt of this decision. This decision will remain in effect during appeal unless a written request for a stay is granted.

MITIGATION AND MONITORING

It is important for the reviewer of this Decision to note that the BLM, NDEP, and Cortez have worked together to limit impacts to all resources that may result from the project. This is accomplished in a number of ways, including strict adherence to applicable State and Federal regulations, use of Best Management Practices, and building environmentally sound design features and committed practices into its POO. Working in this manner, the BLM, NDEP and Cortez are able to limit potential environmental harm or impacts early in the process, thus limiting extensive required corrective measures later.

An example of this is the proposed watering and use of chemical dust palliative such as calcium or magnesium chloride. Cortez, based on past experience and working with the BLM and NDEP, agreed to propose this in the submitted plan of operations as a means to limit the generation of fugitive dust during their operations. Use of water and chloride agents is a proven way to limit the impacts of the generation of excessive fugitive dust by mining operations. By incorporating these measures into the POO, the impacts to air quality from fugitive dust emissions are restricted to below regulated levels. The end result is a low level of impact to air quality that requires no further mitigation measures.

This Decision expressly incorporates each of the following mitigation measures and monitoring requirements (the "Stipulations").

1) Monitoring: The BLM requires the minimum quarterly (once every three months) monitoring of all cyanide facilities located on Public Lands; and of those cyanide facilities located on private lands for which the BLM is responsible, as designated by the MOU between the NDEP and the Nevada BLM.

The Shoshone-Eureka Resource Area Minerals Staff include as part of these quarterly cyanide inspections the monitoring of the mitigation measures and resulting stipulations of all major plans of operation approvals. As part of this Decision, the Shoshone-Eureka Minerals Staff, along with certain members of its environmental staff, while completing their quarterly cyanide inspections, will include the monitoring of the environmental analysis of the Draft and FEIS as well as the mitigation measures presented here. Successful implementation of the analysis and mitigation will be recorded and kept in the appropriate case file. Unsuccessful analysis or mitigation will be brought to the immediate attention of Cortez and the District Manager, Battle Mountain District Office. The BLM will ensure the immediate correction of or reduction of any environmental harm that may result from the unsatisfactory mitigation.

2) Cortez has agreed to supply the Shoshone-Eureka Resource Area, Battle Mountain District Office BLM with copies of all past and future correspondence, permit applications, permit approvals, computer modeling efforts, and any related documentation related to the current ground water contamination and remediation efforts associated with that ground water contamination.

Within ninety (90) days of the issuing of this Decision, Cortez has agreed to enter into a Memorandum of Understanding with the NDEP and the BLM (Battle Mountain District Office). (Applicant volunteered action)

3) Erosion and sedimentation impacts from soils not successfully reclaimed will require the following: a) reclamation efforts will be monitored longer than the three years proposed as part of standard reclamation procedures outlined in Section 2.0 of the Draft EIS, b) if reclamation efforts are not successful during the extended monitoring period, additional seedbed preparation and reseeding would be implemented. (From the Draft EIS, page 4-14, Chapter 4.3.4)

4) During construction, clearing of land for stockpiles and other project facilities should create curvilinear boundaries instead of straight lines (Within safety, geotechnical, and appropriate engineering parameters) to minimize disturbance of the landscape. Grading should be done in a manner that will minimize erosion and conform to natural topography. To the extent practicable, all foliage adjacent to the site should remain undisturbed to provide maximum available screening of the installation relative to the landscape character type. Where the opportunity exists, strategic location techniques should be used to minimize the visibility of mining activities. (From page 4-32, 4.8.3 of the Draft EIS)

5) Cortez shall establish, during the first 18 months following this Decision, test reclamation plots to study the effectiveness of alternative seed mixtures and fertilizer combinations and the ability of tailings and heap leach facilities to support revegetation. The Authorized Officer, in cooperation with Cortez, may determine that the initial plots may be supplemented with additional plots at a later date, based upon the results of these efforts. The efforts shall be documented in a biannual report documenting the success/failure results of these efforts. Information developed from these test plots shall be utilized by the Authorized Officer in the selection of appropriate reclamation and revegetation measures or treatments to be implemented during reclamation. (Applicant Volunteered action)

6) During operations all disturbed but unreclaimed areas associated with this approval (i.e. the 428 acres described in the POO amendment) shall be monitored periodically by Cortez in a manner acceptable to the BLM to identify whether noxious plants

species (as identified by state and Federal regulations) have invaded the project area. During operations, an annual report of the results of such monitoring shall be provided to the BLM. Reasonable measures to eliminate such species within the project area may be imposed as a further condition of this Decision by the Authorized Officer.

All use of and proper waste disposal of pesticides/herbicides are the responsibility of Cortez. Herbicide loading sites will be documented and all spills reported and cleaned-up immediately. (From the Final EIS, "Revegetation Standards For Nevada's Surface Management Program"; also Bureau Authorities under: Federal Land Management Policy Act; Public Rangelands Improvement Act of 1978; Federal Noxious Weed Act of 1974; Departmental Manual Parts 609 and 517; Carlson-Foley Act of 1968 Public Law 90-583; Executive Order 11987, Exotic Organisms)

7) Following the completion of mining operations, Cortez shall exclude access and mitigate safety hazards posed by the Gold Acres London Extension pit walls by reclaiming or berming all access roads and fencing the perimeter of the pit as directed by the Authorized Officer, taking into account post mining land uses for the area. Signs shall be posted by Cortez on access roads in the vicinity of pits, as well as along the fences, warning visitors and the general public of the potential for unstable conditions or hazards. (From the Draft EIS, applicant committed practices)

8) Cortez has volunteered to implement two informal programs for its employees to increase their awareness of the value of wildlife resources and the historical cultural properties in the mine area. All existing employees and all new employees shall be advised in writing of the responsibility of employees to avoid inadvertent harm to wildlife resources and important cultural properties. All employees shall be advised of the fragility of such resources. (Applicant Volunteered action)

9) Cortez shall inspect all cyanide solution containment facilities at least weekly for wildlife mortalities. Any wildlife mortalities shall be reported to the Nevada Department Of Wildlife (NDOW) and the BLM within 24 hours of discovery. The quarterly wildlife mortality reports sent to the NDOW will be courtesy copied to the Authorized Officer. (NDOW Artificial Industrial Artificial Pond Permit)

10) A monitoring schedule will be developed jointly by the BLM and Cortez within 90 days from the Effective Date of this Decision. This schedule shall reflect a systematic, prioritized, and detailed description of all monitoring actions required by this Decision. This monitoring plan shall be reviewed annually by the BLM to determine necessary changes. (Required by CEQ Regulations)

11) Cortez shall initiate revegetation efforts for waste rock disposal areas and decommissioned heap leach pads (those approved by this Decision) as soon as practical and such revegetation shall not be deferred until the conclusion of all mining operations in the project area. (Applicant committed practice)

12) Any significant modification of the POO affecting Public Lands or resources must be reviewed and approved by the Authorized Officer prior to its implementation. BLM reserves the right to request Cortez to modify its POO in accordance with 43 CFR 3809 in the event that the BLM determines that Cortez's operations would cause or are causing unnecessary or undue degradation of Public Lands or resources. (From 43 CFR 3809)

13) Cortez must comply with applicable Federal and State laws dealing with the storage and disposal of chemicals, petroleum, petroleum products, Resource Conservation and Recovery Act (RCRA) Subtitle C hazardous wastes, and RCRA Subtitle D solid wastes. Under no circumstances can chemicals, petroleum, petroleum products, or RCRA Subtitle C hazardous wastes be disposed in solid waste disposal areas on the mine or millsite without the written approval of the NDEP.

The operator must identify what waste products will be produced, whether the waste streams are hazardous or solid, and the disposal method and location. If hazardous wastes are generated, the operator must obtain an Environmental Protection Agency (EPA) generator identification number from the State DEP and must manifest all shipments off-site. Copies of the manifests must be available for the Authorized Officer's inspection. (BLM's Cyanide Management Policy)

14) The Federal EPA noted that the 12" of growth medium proposed for the covering of any capped tailings ponds (see Response I 22,26 of the FEIS) would not maintain adequate water-holding capacity to support plant life during dry periods and prevent cracking of the proposed tailings cap.

The BLM concurs with this position. The FEIS notes the need to add an additional 6" of growth medium (total of 18") on the proposed cap (if an impermeable cap is needed).

This action creates an additional shortage of available growth medium for final reclamation.

Based on experience both at Cortez and other mine properties, Cortez has agreed to study the use of waste rock "fines", including the use of amendments (fertilizers, mulches, etc.). The use of these "fines" on certain waste rock dumps should reduce the noted growth medium shortage. (Applicant Committed Practice)

PUBLIC INVOLVEMENT

The POO was originally submitted to the Shoshone-Eureka Resource Area of the Battle Mountain District BLM in June, 1990. On Thursday, June 21, 1990, the BLM published in the Federal Register a Notice of Intent to prepare an EIS on the submitted POO.

Local news releases and radio and television announcements preceded two public scoping meetings held by the BLM to solicit public input on the proposal. The first meeting was held at the Elko District Office of the BLM at 3900 East Idaho Street, Elko, Nevada at 7:00 p.m. on July 10, 1990. A second meeting was held at the Peppermill Hotel/Casino at 2707 South Virginia Street, Reno, Nevada at 7:00 p.m. on July 11, 1990. A 90 day period was also available to the public to supply the BLM with written comments on the project. Based upon the public comments received and issues and concerns identified within the BLM, a Draft EIS was prepared by the BLM with the assistance of a third party contractor, Woodward-Clyde Consultants/JBR Consulting Group. The Draft EIS was filed with the Federal Environmental Protection Agency, which filed a Notice of Availability on Thursday, December 24, 1992.

The Draft EIS was sent to over 120 persons, groups, and Federal and State Agencies, including the Nevada State Clearinghouse. Federal Agencies receiving the Draft EIS included the Environmental Protection Agency, the Army Corps of Engineers, the National Park Service, the Bureau of Mines, and the U.S. Fish and Wildlife Service. Public meetings soliciting additional input were conducted in Elko and Reno, Nevada on January 19th and 20th, 1993 respectively. Five letters and one public verbal comment were received by the Battle Mountain Office BLM on the Draft EIS. Each of the letters and oral comments was individually reviewed by the BLM and all substantive comments have been addressed in the Abbreviated Final EIS and/or this Decision.

Issues and concerns raised during the public involvement process which were addressed in the EIS included: air quality from construction of the project, ground water contamination, both on-going and possible future contamination, acid rock drainage potential and its effects on the environment, reclamation of this new facility and existing disturbance, impacts to wildlife, including potential impacts to threatened and endangered species or Candidate Species.

COVER SHEET

CORTEZ GOLD MINES EXPANSION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

( ) DRAFT
(X) FINAL

(X) ADMINISTRATIVE
( ) LEGISLATIVE

LEAD AGENCY
U.S. DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT

COOPERATING AGENCY

Nevada Division of
Environmental Protection

Date by Which Comments
Must Be Received Or
Postmarked By:
September 13, 1993

EIS CONTACT
Comments on this FEIS
should be directed to:

Dave Davis
Bureau of Land Management
Battle Mountain D.O.
P.O. Box 1420
Battle Mountain, NV 89820

Date FEIS Mailed to Public:
August 9, 1993

ABSTRACT

The Cortez Gold Mines Expansion project is a proposed 428 acre expansion of a large existing gold mine. The project is located in Lander County, Nevada. The project includes expanding an existing open-pit mine and waste rock dumps; constructing new heap leach facilities, tailings disposal facilities, and waste rock dumps; and continuing exploration drilling.

Pursuant to other numerous regulations and laws, this document's review has been coordinated with: U.S. Fish and Wildlife Service; Army Corps of Engineers; Nevada Division of Environmental Protection, Mining and Air Quality Bureaus; Nevada State Historic Preservation Office; Environmental Protection Agency; U.S. Bureau of Mines; National Park Service.

Billy R. Templeton

DATE: 7/19/93

Billy R. Templeton
State Director, Nevada

Section Page

1.0 INTRODUCTION 1-1

2.0 SUMMARY 2-1

2.1 PURPOSE AND NEED TO WHICH THE BLM IS RESPONDING 2-1
2.2 DESCRIPTION OF THE PROPOSED ACTION 2-2

2.2.1 Design Measures 2-3

2.3 Alternatives 2-4
2.4 Summary of Impacts 2-4

2.4.1 Air Quality 2-5
2.4.2 Geology, Minerals, Paleontology 2-5
2.4.3 Soils and Topography 2-5
2.4.4 Water Resources 2-5
2.4.5 Vegetation 2-6
2.4.6 Wildlife Resources 2-6
2.4.7 Recreation and Wilderness 2-6
2.4.8 Visual Resources 2-7
2.4.9 Social and Economic Values 2-7
2.4.10 Land Use/Livestock Grazing 2-7
2.4.11 Cultural Resources 2-7

3.0 COMMENTS AND RESPONSES 3-1

COMMENTOR I - U.S. ENVIRONMENTAL PROTECTION AGENCY I-1

RESPONSES TO COMMENTOR I I-10

COMMENTOR II - TAME TIC COMMITTEE OF THE WESTERN STATES PIPE TRADES COUNCIL II-1

RESPONSES TO COMMENTOR II II-14

COMMENTOR III - NATIONAL WILDLIFE FEDERATION III-1

RESPONSES TO COMMENTOR III III-14

Section | Page

COMMENTOR IV - WILDERNESS IMPACT RESEARCH FOUNDATION IV-1

COMMENTOR V - U.S. BUREAU OF MINES V-1

COMMENTS SUBMITTED AT PUBLIC MEETINGS VI-1

LIST OF APPENDIXES

APPENDIX A METEORIC WATER MOBILITY/ACID BASE ACCOUNTING FOR CORTEZ AND GOLD ACRES WASTE ROCK AND TAILINGS AND WATER QUALITY INFORMATION FOR CORTEZ PIT

Appendix A1 Meteoric Water Mobility and Acid-generating Potential for Waste Rock and Tailings Impoundment Number 6, Third Quarter 1991 through First Quarter 1993

Appendix A2 Cortez Pit Water Quality

APPENDIX B GROUNDWATER MONITORING PROGRAM

APPENDIX C NEVADA DEPARTMENT OF ENVIRONMENTAL PROTECTION (NDEP) RESPONSES REGARDING ACTION LEVELS FOR SOIL CLEANUP, GROUNDWATER STANDARDS, AND POSTCLOSURE MONITORING

APPENDIX D NEVADA DEPARTMENT OF ENVIRONMENTAL PROTECTION (NDEP) WATER POLLUTION CONTROL PERMIT

APPENDIX E APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

APPENDIX F REVEGETATION STANDARDS FOR NEVADA'S SURFACE MANAGEMENT PROGRAM

APPENDIX G PERTINENT AIR QUALITY DATA (TABLES 1, 2, AND 3)

APPENDIX H RESPIRATOR PROGRAM

1.0
INTRODUCTION

This Final Environmental Impact Statement (FEIS) includes a summary of the Proposed Action and Alternatives, a record of written and verbal public comments received on the DEIS, and responses to those comments. The previously distributed DEIS and this volume together constitute the Final Environmental Impact Statement.

The DEIS on the proposed expansion of the existing Cortez gold mining operation was distributed for public review on December 24, 1992. During the public review period, written comments were received and two public meetings were also held to solicit public comments. The comments received on the DEIS did not require major changes in the data analysis or conclusions. Consequently the DEIS has not been revised or reprinted.

2.0
SUMMARY

Cortez Gold Mines (Cortez) proposes to continue and to expand its existing gold mining and processing operations at the Cortez Gold Mine in north-central Nevada. The proposed expansion is described in a 1990 Plan of Operations (Proposed Action) that has been submitted by Cortez Gold Mines (Cortez) to the Battle Mountain and Elko District offices of the Bureau of Land Management (BLM) in compliance with the BLM Surface Management of Public Lands Regulations 43 CFR 3809. The site of the Proposed Action is located within Crescent Valley, south of Battle Mountain. Expansion activities would occur at two nearby locations known as the Cortez and Gold Acres areas. These areas are located about 6 miles apart on opposite sides of Crescent Valley and together represent the Proposed Action expansion area. Several other mining operations (mining primarily precious metals) are located in the general vicinity. The Proposed Action includes expanding an existing open-pit mine and waste rock dumps; constructing new heap leach facilities, tailings disposal facilities, and waste rock dumps; and continuing exploration drilling. Mining activities are proposed in Lander County, Nevada, on both patented and unpatented lands; exploration activities are proposed in Lander and Eureka counties. A total of approximately 428 acres would be affected by the Proposed Action.

The reserves to be mined include both mill-grade and heap-leach-grade ore. Portions of the ore would be hauled to the existing Cortez mill for processing, and portions of the ore would be processed at the proposed heap leach facilities. Overburden from the pit areas would be hauled to waste rock dumps near each pit. Exploration activities would generally consist of limited road building and exploration drilling.

2.1 PURPOSE AND NEED TO WHICH THE BLM IS RESPONDING

The Proposed Action would provide sufficient ore to allow for the continued operation of the existing milling facilities currently operated by Cortez. The Proposed Action does not represent a significant change in the annual mining and production rates, nor does it represent an increase in project workforce or equipment needs. The Proposed Action would allow Cortez to continue to employ the existing workforce and to optimize use of the existing equipment and mineral-processing facilities. Without the Proposed Action, Cortez's mining and mineral processing operations would cease sometime during the period 1994-1996.

The BLM has reviewed the Proposed Action and has determined that preparation of an Environmental Impact Statement (EIS) is necessary. The BLM is serving as the lead agency for preparation of an EIS in compliance with the National Environmental Policy Act (NEPA). This EIS has been prepared in compliance with NEPA and BLM Handbook H-1790-1. The EIS describes the Proposed Action components, reasonable alternatives, potential environmental consequences of the project and alternatives, and design measures or mitigation measures capable of eliminating or reducing potential significant impacts.

2.2 DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action includes new heap leach facilities and expansion of an existing open-pit mine in the Gold Acres area, expansion of existing heap leach facilities and construction of tailings disposal facilities in the Cortez area, and ongoing exploration drilling. Waste rock dumps for overburden disposal would be expanded in the Gold Acres and Cortez areas. In addition, one new waste rock dump would be constructed in the Gold Acres area. Surface disturbance would result primarily from expansion of an existing pit (1 acre), waste rock dumps (196 acres), heap leach pads (54 acres), and tailings impoundment (81 acres). The additional tailings impoundment is proposed to provide storage capacity of about 2,700 acre-feet. At the current level of tailings production, the proposed impoundment would provide storage of tailings for approximately 7 years. The proposed site for the tailings facility is located directly north of the existing heap leach pads in the Cortez area. The tailings produced during the first 2 years of activity for the Proposed Action would be disposed of in the existing Tailings Pond No. 6. The embankment of Tailings Pond No. 6 would be raised approximately 8 feet to accommodate the additional tailings. This construction would not disturb any additional acreage.

The Proposed Action would not involve any expansion or major changes in the existing ore processing facilities (e.g., the crushing and grinding circuits, the roaster circuit [oxidation of ore], and the carbon in-leach processing). The ore mined by the Proposed Action would allow for continued operation of the existing facilities, but would not significantly change the daily or annual throughput of these facilities.

The Proposed Action includes reclamation of all proposed disturbance in accordance with BLM surface management regulations and Nevada Department of Environmental Protection regulations. Reclamation would result in an additional 77 acres of disturbance and would be designed to provide a post-mining condition that would support land uses identified in the Shoshone/Eureka and Elko Resource Management Plans.

2.2.1 Design Measures

Several commentors on the DEIS requested more detail regarding design measures that the applicant has included in the Proposed Action. This additional detail does not constitute changes to the project but supplies more information regarding how design measures would provide for environmental protection and/or emergency response. A list of these design features and/or measures is provided below. Please refer to Section 3.0 responses for detail regarding these measures.

- Tailings Pond 6 design and description of liners
- Tailings Pond 7 design and description of liners
- Heap leach facilities design and description of liners
- Groundwater monitoring plan and leak detection
- Wildlife protection measures for tailings and solution ponds
- Cleanup procedures for accidental spills
- Monitoring of acid-generating potential of waste rock and heap leach facilities
- Reclamation procedures and topsoil inventory
- Fugitive dust control
- Worker health and safety monitoring

2.3 ALTERNATIVES

Feasible alternatives for facility locations are limited, because existing processing facilities and open pits are in place. The range of alternatives considered in this EIS therefore consists primarily of operational alternatives and alternative components of the project rather than location alternatives for the entire project. In the alternatives evaluation, the following factors were considered: public or agency issues/concerns, technical and economic feasibility, potential environmental advantage, and ability to meet the purpose and need stated by the applicant.

Based on the screening of operational alternatives, no feasible alternatives were retained for detailed analysis. The EIS contains summaries of the reasons that various alternatives considered were eliminated from detailed analysis.

In accordance with the National Environmental Policy Act, the No Action Alternative is addressed in the EIS. Under the No Action Alternative, Cortez would not expand the existing Gold Acres pit or construct the new processing facilities. Instead, it would continue to mine ore from the various existing pits as authorized by existing approvals. However, Cortez' mining and mineral processing operations would run out of ore sometime in 1994-1996, resulting in a closure of operations.

For purposes of this EIS, the No Action Alternative would result from the BLM's disapproval of Cortez' 1990 Plan of Operations. However, other circumstances, such as a drop in gold prices or the application of some future legislation, could also potentially result in mine closure. The objective of the No Action Alternative is to describe the environmental consequences that would result if the Proposed Action is not implemented in order to assist EIS readers with the evaluation of consequences from the Proposed Action.

2.4 SUMMARY OF IMPACTS

A comparison and summary of the impacts associated with the implementation of the Proposed Action and No Action Alternative is provided in Section 2.5 of the EIS. Detailed information on project impacts is provided in the DEIS distributed December 24, 1992. The summary below highlights potential impacts from the Proposed Action. Impacts associated with the No Action Alternative are only discussed if they would be greater or substantially different from the Proposed Action. In most cases, the No Action Alternative would not result in additional impacts beyond those anticipated by the Proposed Action.

2.4.1 Air Quality

The Proposed Action would continue point source emissions associated with ore processing and would result in fugitive dust emissions from open pit expansion, operation of haul roads, and exploration. There would not be significant increases to maximum 24-hour or annual sulfur dioxide concentrations or total suspended particulates. Estimates for fugitive dust emissions would not violate state or federal ambient standards. There would not be significant contributions to cumulative 24-hour or annual emissions in the Crescent Valley Air Basin.

2.4.2 Geology, Minerals, Paleontology

Leach pads, ponds, pit walls, and waste rock dumps would be designed to prevent significant structural damage or sediment transport caused by seismic or storm events. No paleontological resources have been identified within the project area.

2.4.3 Soils and Topography

Approximately 428 acres of soil disturbance would result from expansion of facilities and reclamation activities, including growth-medium stockpiles and roads. Sedimentation in perennial water courses is not expected. A shortfall in topsoil necessary for reclamation would occur. Reclamation should be carefully monitored to determine if additional measures need to be taken to provide reclamation success. The Proposed Action contributes less than 5 percent of the total soils disturbance estimated for the projects considered in the cumulative analysis.

2.4.4 Water Resources

There would be only local dewatering, with no effect to other nearby groundwater users. No impacts to surrounding springs, seeps, or other surface waters would occur.

No impacts to groundwater or surface water quality are anticipated. The existing plume near the Cortez processing facilities would not enlarge and will continue to be remediated under direction of the Nevada Department of Environmental Protection. Remediation of the plume will proceed under the same procedures, with or without the Proposed Action.

Laboratory analyses of representative samples of waste rock, tailings, and heap leach indicate neutralization potential exceeds the acid-generating potential. Thus no impacts from acid generation on water quality are anticipated.

Accidental releases of hazardous materials to surface water or groundwater could occur but would be limited by the spill prevention and containment plan included in the project design.

2.4.5 Vegetation

No impacts are anticipated to wetlands, riparian communities, or threatened and endangered species. Cumulative impacts to common vegetation types would be insignificant.

2.4.6 Wildlife Resources

Removal of moderate- to low-quality wildlife habitat and indirect impacts due to traffic, noise, and human presence are not considered significant. Contribution to cumulative impacts would be less than 5 percent of the total cumulative impact. No critical wildlife habitat or species would be affected.

Acute toxicity in tailings ponds is not likely. Chronic toxicity could be significant at the Cortez tailings facility or could be cumulatively significant due to multiple exposures from other projects in the region.

2.4.7 Recreation and Wilderness

No impacts are anticipated.

2.4.8 Visual Resources

Short-term impacts would occur consistent with BLM objectives for the project landscape. Long-term impacts after reclamation would not be significant.

2.4.9 Social and Economic Values

There would be no increase in demand on schools and infrastructure in affected communities. In a cumulative sense, the expansion project would continue to contribute to a significant regional impact on schools and infrastructure, particularly in Elko, Nevada.

Additional revenues for Lander County would be generated because of an increase in assessed valuation.

2.4.10 Land Use/Livestock Grazing

No significant impacts are anticipated.

2.4.11 Cultural Resources

No sites eligible for the National Register of Historic Places would be affected. The Proposed Action would not significantly contribute to cumulative losses of historic or prehistoric resources.

The continued presence of mining in the viewshed of Mt. Tenabo is considered an indirect impact to Native American tradition and/or religious values associated with Mt. Tenabo.

3.0
COMMENTS AND RESPONSES

The following subsections provide a copy of the comments received from each commentor, together with responses to these comments. Each comment letter is followed by the relevant responses.

COMMENTOR I

3/5/93

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, Ca. 94105

March 1, 1993

Dave Davis
Bureau of Land Management
Battle Mountain District Office
P.O. Box 1420
Battle Mountain, NV 89820

Dear Mr. Davis:

The U.S. Environmental Protection Agency (EPA) has reviewed the **Cortez Gold Mine Expansion Project Draft Environmental Impact Statement (DEIS), Lander and Eureka Counties, Nevada.** Our comments on this DEIS are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementation Regulations (40 CFR Parts 1500-1508), and EPA's authorities under §309 of the Clean Air Act.

The DEIS evaluates a proposal to expand the Cortez Gold Mine, which would include expanding an existing open-pit mine and waste rock dumps; constructing new heap leach facilities, tailings disposal facilities, and waste rock dumps; and continuing exploration drilling. Approximately 428 acres would be affected by the proposed project.

We have rated this DEIS as EO-2 -- Environmental Objections-Insufficient Information. Our rating is based on the project's potential impacts to water quality and biological resources, as well as the need for additional information in the Final Environmental Impact Statement (FEIS) regarding the proposed project's potential impacts to water quality, vegetation, and wildlife as well as facility design, monitoring, and reclamation.

We do not believe that the DEIS sufficiently analyzes the proposed project's potential to generate acid mine drainage. Therefore, questions remain regarding the appropriateness of facilities designs and reclamation. The FEIS should address in greater detail the potential for generation of acid rock drainage from the project sites, as well as measures to prevent and/or control such drainage and the potential impacts of a release of acid drainage to the environment.

We appreciate the opportunity to review this DEIS. Please send a copy of the FEIS to this office at the same time it is officially filed with our Washington, D.C., office. If you have any questions, please call me at (415) 744-1015 or Jeanne Dunn Geselbracht, Office of Federal Activities, at (415) 744-1576.

Sincerely,

Jacqueline Hyland

for Deanna M. Wieman, Director
Office of External Affairs

Enclosures

000477/92-459

cc: Dick Reavis, NDEP
Tom Fronapfel, NDEP
Mary Jo Elpers, U.S. Fish & Wildlife Service

SUMMARY OF RATING DEFINITIONS AND FOLLOW-UP ACTION

Environmental Impact of the Action

LO-Lack of Objections

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC-Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO-Environmental Objections

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU-Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of environmental quality, public health or welfare. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommend for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1-Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2-Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3-Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From: EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

Water Quality

EPA is greatly concerned about the impacts of acid rock drainage to surface water and groundwater at mine sites throughout the United States. Acidic drainage generated at mines results not only in the release of low pH waters but in mobilization of metals and other pollutants as well. Acid drainage may take many years or decades to initially appear depending on several factors including geochemistry of the waste rock and tailings, saturation of the waste rock and tailings, rate of precipitation, and hydrogeology of the area. It is extremely important to accurately predict, prevent, and control acid mine drainage in order to preserve environmental resources such as water quality and healthy vegetation and aquatic biota. We encourage BLM to work with the project proponent to develop conservative facilities designs and monitoring plans. We believe that these early measures are cost-effective and prudent considering the environmental and economic costs of corrective action measures later.

According to the DEIS, waste rock in the waste rock dumps is not
expected to produce acid in amounts exceeding the neutralizing
potential of the waste rock. This prediction is based on the
lack of evidence of acid generation in any of the existing waste
rock dumps in the areas of proposed mining. The FEIS should
indicate the age of the waste rock dumps in these areas as well 1
as discuss in greater detail the geology of the proposed project
sites. The FEIS should discuss the tests that were performed to 2
determine acid potential/neutralization potential of the waste
rock and include the results of those tests.

The FEIS should discuss the acid generating potential of the 3
tailings and the leach heaps and include the test results.
Neutralizing minerals in waste rock, tailings, and ore may be
present in sufficient quantities to prevent acid generation for
years before pH begins to decrease relatively rapidly. Waters in
contact with historic pits and tailings which have been exposed
for several decades can be good indicators of acid potential. 4
The FEIS should provide water quality data for these older
facilities at the Cortez and Gold Acres sites and discuss their
relevance as indicators of potential acid generation at the
proposed expansion sites. The FEIS should also discuss the 5
specific potential impacts of acid rock drainage to all
environmental resources.

If the tailings would be acid generating, we recommend the 6
addition of sufficient limestone admixed in the mill feed as a

buffer to minimize pyrite oxidation of tailings and subsequent acid generation. 6

The FEIS should discuss whether Tailings Pond No. 6 is lined. If it is not, we recommend that the pond not be used for tailings disposal under the proposed project in light of existing contamination resulting from unlined tailings ponds. 7

The FEIS should discuss the design parameters of Tailings Pond No. 7, the proposed heap leach facilities, and ditches and overflow ponds including thickness and permeability of the liners.

The FEIS should describe the leak detection system and groundwater monitoring well network. We recommend that the monitoring plan include both groundwater and vadose zone monitoring (e.g., suction lysimeters) beneath Tailings Pond No. 7, leach pads, and waste rock dumps. 8

The DEIS states that concentrations of weak acid dissociable (WAD) cyanide in the proposed tailings impoundment would be maintained below the level toxic to wildlife (p. 2-20). Elsewhere, the DEIS implies that the older heap leach solution ponds and ditches are not netted or covered for wildlife protection because the concentration of WAD cyanide is less than 10 parts per million (ppm) (pp. 2-7 and 2-8). The FEIS should discuss whether this threshold is relevant in determining whether ponds should be netted and indicate if these ponds will continue to operate under the proposed alternative. If so, we recommend that all solution ponds and ditches that could potentially be hazardous to wildlife be netted or covered. 9

The DEIS states that in the event of a cyanide spill, soils with total cyanide concentrations exceeding 10 mg/kg would be excavated. The FEIS should discuss the source of the 10 mg/kg action level as well as the health risks associated with it and the projected fate and transport or degradation of cyanide at this concentration in soil that is not exposed to air or sunlight. 10

The monitoring plan should be provided in the FEIS and include the action levels and contingency measures that would be taken should action levels be exceeded in surface water, groundwater, or soils. 11

The DEIS does not indicate whether any of the intermittent streams and washes on the project site are waters of the U.S. The FEIS should identify and describe all waters of the U.S. that could be affected by the proposed project. A map depicting these 12 waters should be provided. The FEIS should also discuss whether any of the proposed activities would require a Clean Water Act §404 permit from the U.S. Army Corps of Engineers. If so, the FEIS should discuss whether the proposed project would comply with the Federal Guidelines for Specification for Disposal Sites of Dredged or Fill Materials (40 CFR 230), promulgated pursuant to Clean Water Act §404(b)(1). 12

The §404(b)(1) Guidelines require that the project:

- be the practicable alternative which would have the least adverse impact on the aquatic ecosystem [40 CFR 230.10(a)];

- not violate State water quality standards or jeopardize any federally-listed threatened or endangered species [40 CFR 230.10(b)];

- not cause or contribute to significant degradation of waters of the U.S., including wetlands [40 CFR 230.10(c)];

- include all appropriate and practicable steps to minimize adverse impacts on the aquatic ecosystem (i.e., mitigation) [40 CFR 230.10(d)].

The FEIS should include a map **clearly** depicting the extent of groundwater contamination at the project sites with respect to existing and proposed facilities, the locations of the pollution control wells, and the potentiometric surface. The FEIS should also describe the treatment and fate of the pumped water from pollution control wells. 13

The DEIS provides existing water quality data for the project sites. The FEIS should include a table indicating water quality standards for reference. 14

The significance criteria for surface water and groundwater (DEIS, pp. 4-14 and 4-15) should include exceedence of any water quality standard. 15

Closure and Reclamation

The DEIS states that Cortez is working with BLM and the Nevada Division of Environmental Protection to prepare a detailed reclamation plan and bond estimation for the post-January 1, 1981, disturbance at the project sites. The FEIS should explain how and by whom pre-January 1, 1981, disturbances will be reclaimed. 16

The DEIS indicates that the objective of reclaiming the tailings pond would be to eliminate any continued direct contact with solutions containing potentially harmful amounts of cyanide, preventing release of fugitive tailings dust, and providing a land use in concert with the stated post-mining land use objectives. Reclamation should also be conducted in such a manner as to ensure prevention of acid rock drainage, not only from tailings ponds but from waste rock dumps and heap leach facilities as well. For example, measures to keep runon and runoff away from contact with tailings, waste rock, and leach heaps (such as impermeable covers and runon/runoff channels) should be seriously considered. 17

The FEIS should include contingency plans in the event that acid drainage is generated from waste rock piles, tailings ponds, or leach pads after reclamation has been completed. The FEIS should also indicate who would be responsible for maintaining systems that collect and treat such drainage. 18

The DEIS states that maintenance of erosion control and sediment control facilities as required would be conducted until the reclamation of the leach facility was considered to be complete (p. 2-27). Cortez Gold Mines should be required to continue any ongoing mitigation or cleanup for as long as necessary, even after closure of the site and release of bonds. The FEIS should indicate who will be required to ensure post-closure maintenance of covers for tailings, waste rock dumps, and leach heaps as well as runon/runoff protection berms and diversion structures. 19

The FEIS should discuss the design of the covers for the tailings piles, waste rock dumps, and heap leach facilities to preclude meteoric water from generating acid rock drainage. The discussion should include their permeability and anticipated effectiveness. We recommend that monitoring of seepage from tailings, leach heaps, and waste rock piles be required indefinitely after closure. 20

Adverse impacts to surface water or groundwater quality may not become apparent until years after mine operations cease. The FEIS should discuss the provisions that will be made in the Plan of Operation to ensure adequate financial resources to implement corrective action and/or mitigation measures that may be necessary years after mine closure. 21

On page 4-13 of the DEIS, it is stated that because "there would be a minor to moderate shortfall in topsoil available from salvaging, about 25 acres of slopes would not be topsoiled and revegetation on these sites might not stabilize the slope." Elsewhere in the DEIS (p. 2-34), it is stated that topsoil would 22 only be available in sufficient quantity to cover 67 percent of the disturbed area. The FEIS should clarify this discrepancy and identify the material that would be used to cover the remaining one-third of the disturbed area to provide a substrate for vegetative growth and how it would be expected to affect the success of revegetation. EPA urges BLM to require reclamation and reestablishment of vegetation on all disturbed acres on the project sites. 22

The FEIS should discuss the criteria that would be used to determine the success of revegetation efforts and contingency measures should the original revegetation efforts fail. 23

According to the DEIS, if reclamation is not successful, substitute topsoil materials could be obtained from Cortez reasonably foreseeable projects (p. 4-14). However, pursuant to the Council on Environmental Quality's NEPA Implementation Regulations at 40 CFR §1506.1, no action on a project shall be taken until the Record of Decision for that project is issued. Therefore, topsoil from a future project site could not be made available until BLM completes the NEPA process and issues a Record of Decision for that future project. 24

Figures 2.2-2 and 2.2-3 do not clearly depict Tailings Ponds No. 6 and No. 7, and it is unclear whether Tailings Pond No. 6 is included in these reclamation areas. The FEIS should include a map that clearly depicts these ponds and clarify that Tailings Pond No. 6 would be reclaimed upon completion of its use. 25

Biological Resources

The FEIS should discuss how revegetation would be accomplished on sites that are covered with impermeable caps, the necessary thickness of the topsoil, and how vegetation would be maintained so as not to allow growth of species with relatively deep roots that would cause cracks in the cap. We note that Bitterbrush (Purshia tridentata) is included in the seed mixture proposed for revegetation. The FEIS should include an analysis of the impacts that such a shrub would have on the effectiveness of an impermeable cap. In addition, the FEIS should discuss whether a soil thickness greater than one foot would be necessary to preclude cracking of the cap. 26

Destruction of dense sagebrush/rabbitbrush habitat at the proposed project site could eliminate a local population of pygmy rabbit, a Candidate 2 species. We note that rabbitbrush is not included in the seed mixture for proposed vegetation reclamation. The FEIS should indicate the number of acres of pygmy rabbit habitat that would be disturbed and discuss whether rabbitbrush 27 is expected to naturally reestablish in reclaimed areas, how long such reestablishment would take, and whether rabbitbrush roots would cause cracking of the cap. The FEIS and Record of Decision should commit to full mitigation for disturbance/destruction of this habitat. Based on past experience, full restoration of habitat is extremely difficult on arid reclaimed mine sites. Indeed, the DEIS states that after reclamation "the resulting vegetative communities and wildlife habitat are likely to be different from the original communities for the long term" (p. 4-44). If full restoration is unlikely, or if reestablishment of dense sagebrush/rabbitbrush is undesirable in light of the need to maintain cap integrity, the FEIS and Record of Decision should commit to full replacement of this habitat. 27

EPA encourages BLM to revegetate disturbed areas with appropriate native plants in an effort to reestablish the biological diversity of the original vegetative communities on the project site. 28

RESPONSE TO COMMENT I-1

The I waste rock dump at Gold Acres is the only waste rock dump in this area which has not been covered with waste rock from recent mining activities. This dump dates back to the 1970s and exhibits no visual evidence of acid generation. The C and D dumps at Cortez were constructed in the 1960s and 1970s. Neither of these dumps exhibits any visual evidence of acid generation.

The geology of the proposed project sites is discussed in Section 3.2 of the DEIS. The Proposed Action is located adjacent to areas that have historically been mined at Gold Acres and Cortez. Therefore it is anticipated that the potential acidity and the gross neutralization potential of the waste rock generated from new mining activity would be similar to the potential observed at the sites mined in the past. Results of the waste rock analysis for acid-generation and neutralization potentials and meteoric water mobility are discussed in response to Comment I-2 below.

RESPONSE TO COMMENT I-2

Cortez has been conducting waste rock analysis on a quarterly basis since mid-1991 at both the Cortez and Gold Acres sites. These analyses include meteoric water mobility, static acid generation, and acid-neutralization potential (Appendix A). Analyses for Cortez waste are considered representative of the mining proposed at the Cortez site.

The acid-generating potential represents the potential for a soil or similar material to generate acid and is measured in tons of $CaCO_3$ equivalent per 1,000 tons of soil. Acid-generating potential is expressed as the quantity (in tons) of $CaCO_3$ equivalent that would be required to neutralize the acid generated in the soil material.

Conversely, the neutralization potential is the actual buffering capacity present and is expressed in tons of $CaCO_3$ equivalent per 1,000 tons of soil.

The five quarterly sample analyses of waste rock material at Cortez indicates a minimum acid potential of 0.938 ton/1,000 tons and a maximum acid potential of 10.3 tons/1,000 tons. Since the neutralization potential (304-493 ton/1,000 tons) well exceeds the acid-generation potential in each sample and the pH is alkaline, the potential for significant acid generation and subsequent metal mobility is very low. Meteoric water sampling results indicate very low concentrations of metals and metal-associated ions (Appendix A).

Maximum Potential Acidity ton/1,000 tons	10.3	1.25	2.5	5.0	0.938
Gross Neutralization Potential ton/1,000 tons	369	493	366	322	304
pH	9.47	8.27	9.48	8.50	9.40

Quarterly data for the Gold Acres area for the period prior to the third quarter of 1992 are representative of waste rock generated from the mining of oxide ore. Gold Acres data generated after this period is most representative of waste rock associated with carbonaceous ore. The proposed mining at Gold Acres will consist primarily of mining carbonaceous ore.

The acid-generation potential for oxide ores (i.e., prior to third quarter 1992) ranged from 1.3 to 85.95 tons/1,000 tons, while the neutralization potential ranged from 23.9 to 238 tons/1,000 tons. Since the neutralization potential far exceeds the acid-generation potential in each sampling period, significant acid generation is not expected. The neutral to slightly alkaline environment is not conducive to metal mobility (Appendix A).

Maximum Potential Acidity ton/1,000 tons	2.2	1.3	7.8	85.9
Gross Neutralization Potential ton/1,000 tons	23.9	236	76.8	238
pH	7.30	8.34	7.54	7.21

The acid potential increases for carbonaceous ores (i.e., after third quarter 1992), ranging from 31.9 to 108 tons/1,000 tons. The neutralization potential still exceeds acid-generation potential and the neutral environment minimizes metals mobility, as indicated by the low metal values in the meteoric water samples (Appendix A).

Maximum Potential Acidity ton/1,000 tons	31.9	108
Gross Neutralization Potential ton/1,000 tons	97.4	187
pH	7.88	7.43

RESPONSE TO COMMENT I-3

Quarterly acid-generating and acid-neutralization potential of the solids fraction of the tailings discharge have been performed since mid-1991. Sample analysis from six quarters of testing has indicated an acid potential ranging from 3.4 to 39.4 tons/1,000 tons, while neutralization potential ranges from 84.6 to 349 tons/1,000 tons. The excess neutralization potential indicates little or no potential for significant acid generation. High pH values indicate little potential for metals mobility (Appendix A).

Maximum Potential Acidity ton/1,000 tons	3.44	29	24.4	16.3	39.4	17.2
Gross Neutralization Potential ton/1,000 tons	349	171	150	157	84.6	322
pH	10.2	9.92	10.9	10.8	10.1	8.5

Heap leach ore has not been tested for acid-generation potential or neutralization potential; however, the test performed on the waste rock generated from the mining of oxide ore at the Cortez and Gold Acres sites are considered representative of the heap leach materials. All of the analysis to date indicates a neutralization potential far in excess of the acid-generation potential.

The meteoric water analysis shown in Appendix A is an indication of metals mobility in water percolating through waste or tailings and discharging to the groundwater or surface waters. The annual precipitation in Crescent Valley is 5 to 7 inches, so the opportunity for any influx of water in the dumps is very limited. The only opportunity would be during the occasional summer thunderstorm event. Also surface waters in the Valley are all ephemeral and flows very short term, allowing for only brief intervals when percolation discharging from a dump could interact with surface waters. The alkaline environment of the underlying subsoils (pH 8-9.5, Appendix B of DEIS) between the dumps and the groundwater aquifers further buffers acidic material and restricts metal mobility.

RESPONSE TO COMMENT I-4

Pit water quality results for the Cortez pit from sampling in July 1992 are provided in Appendix A. Water in this pit has been in contact with pit walls for approximately 20 years. Similar to the discussion above (responses I-2 and I-3), acid-generating potential is low, as evidenced by pH values greater than 8.0. Mobility of metals is also low, as evidenced by low metal concentrations.

No water quality data exist for the Gold Acres pit, because the water table is located several hundred feet below the pit floor. Due to the climatic conditions of the area, meteoric water does not accumulate in the Gold Acres pit in quantities sufficient to warrant monitoring.

No water quality analyses for acid-generation and acid-neutralization potential have been performed for historic tailings. There is no visual evidence of any acid generation within the historic tailings situated in the vicinity of the Cortez and Gold Acres areas.

RESPONSE TO COMMENT I-5

As discussed in the response to Comments I-2 and I-3, standard laboratory analyses of representative samples of waste rock and tailings were performed in accordance with NDEP reporting requirements. The results indicate that for samples analyzed, the neutralization potential exceeds the acid-generating potential.

RESPONSE TO COMMENT I-6

Lime is added to the Cortez process circuits at a rate of approximately 1.5 lb per ton of ore processed. This addition is not made to neutralize potential acid generation of the ore but to maintain a pH level within the process circuit at between 10.5 and 11.0 to conserve cyanide. As discussed above, laboratory analyses indicate that the tailings should not be acid generating.

RESPONSE TO COMMENT I-7

The construction design for Tailings Pond No. 6 included a base blanket (liner) consisting of 12 inches of compacted materials grading medium-dense silty sands and sandy silts with a permeability of approximately 1×10^{-6} cm/sec.

To limit the hydraulic head above the liner in Tailings Pond No. 6, the standing pool of supernatant is minimized by circulating it off the pond and into a water storage reservoir. The water storage reservoir is synthetically lined, with leak detection.

RESPONSE TO COMMENT I-8

Designs for these facilities have not been completed. Design concepts and minimum design criteria for these facilities are as follows:

Tailings Pond No. 7 - The liner system would consist of a composite liner composed of a secondary clay liner and a 60-mil high-density polyethylene (HDPE) primary liner. The secondary liner would consist of a minimum of 12 inches of compacted material having a permeability of not greater than 1×10^{-6} cm/sec. To minimize hydraulic head on the liner system, a series of underdrains would be installed above the primary liner. The underdrains along with the primary liner would extend under the embankment and connect with double-lined collection ditches with leak detection. Double-lined collection ditches would consist of an 80-mil HDPE primary liner over a 60-mil HDPE secondary liner. Leak detection between the primary and secondary ditch liners would consist of an HDPE geonet with detection ports spaced within the ditches.

The collection ditches would drain to double-lined collection ponds with leak detection. Except for liner density, the liner and leak detection system for the ponds would be the same as described for the ditches. The pond liners would be 60-mil HDPE primary over a 40-mil HDPE secondary.

Groundwater monitoring of the facility would be accomplished by constructing three additional monitoring wells (Nos. 80, 81, and 82) around the periphery of the facility. These wells would supplement existing monitoring wells No. 8, TB-13, and TB-15. The location of the existing monitoring wells and those proposed are shown in Figure 5 of Appendix B.

Proposed Heap Leach Facilities - Heap leach pad areas and collection ditches would be lined with a composite liner consisting of a secondary clay liner and a 60-mil HDPE primary liner. The secondary liner would consist of a minimum of 12 inches of compacted material having a permeability of not greater than 1×10^{-5} cm/sec. To minimize hydraulic head on the liner system and protect the system during pad loading, an overliner consisting of 18 inches of ore crushed to a maximum particle size of 3/4 inch or other suitable drain material would be placed over the primary liner. Perforated 4-inch-diameter pipe would be placed on 30-foot centers at the interface of the primary liner and the overliner to direct flow from above the liner to the solution collection ditches.

Leach solution would flow to the periphery of the pad through the overliner and drain pipes to collection ditches having an 80-mil HDPE primary liner. The collection ditches would flow to double-lined solution ponds. The solution ponds would include pregnant solution, barren solution, and settling ponds. These pond liners would be 60-mil HDPE primary over a 40-mil HDPE secondary.

Pad leak detection would consist of perforated pipe in a gravel envelope placed between the primary and secondary liners. Leak detection would be placed such that leakage would be directed laterally beneath the pad to detection ports located within the solution collection ditches.

Leak detection beneath the collection ditch primary liner would also consist of perforated pipe in a gravel envelope running the entire length of ditch. Ditch leak detection would be monitored at detection ports within the ditches at points of intersection with the pad leak detection system.

Pond leak detection would be accomplished by placement of HDPE geonet between the primary and secondary liner. The geonet would drain to a leak detection port for each pond.

Groundwater monitoring for the proposed Cortez leach pad would consist of five wells (Nos. 73, 74, 75, 76, and 77) located around the south, east, and north sides of the facility. The locations of these wells are shown in Figure 6 in Appendix B.

Due to the depth to groundwater in the vicinity of the Gold Acres heap leach facility and the leak detection proposed for the facility, no groundwater monitoring is proposed for this facility.

Monitoring Plan - Leak detection and groundwater monitoring plans for Tailings Pond No. 7 and proposed heap leach facilities are discussed above. Vadose zone monitoring of the tailings, heap leach facilities, and waste rock dumps employing suction lysimeters as suggested in the comment is not proposed. Vadose zone monitoring with suction lysimeters to detect releases from these facilities would not significantly improve the monitoring proposed because the effective area monitored by these instruments is limited.

Suction lysimeters are useful in the qualitative monitoring of materials such as tailings, spent heap leach ore, or waste rock where these materials have a significant acid-generation potential or metals mobility. As discussed in the responses to Comments I-1 through I-3, the testing of these materials indicates that there would not be significant acid-generation potential or metals mobility. Therefore, the use of suction lysimeters is not proposed.

RESPONSE TO COMMENT I-9

A 50-ppm WAD cyanide level is acknowledged by the Nevada Department of Wildlife (NDOW) as the threshold of lethal levels for waterfowl in Nevada. The threshold for lethal levels is based upon field observations, and has not been verified in laboratory studies. NDOW, which issues permits for industrial ponds (including cyanide systems) in Nevada, allows tailings ponds to remain uncovered if cyanide concentrations are held below lethal levels. Lethal levels are further defined by NDOW as levels below which no mortality occurs. The industrial pond permit also states that systems must be in place on open ponds to reduce cyanide concentrations should wildlife mortality become evident.

The comment also notes that the DEIS implies that older heap leach solution ponds and ditches are not netted or otherwise covered. This is an accurate assumption. NDOW industrial pond permit regulations require netting or other cover for all new heap leach solution ponds and ditches but not for older facilities that have already been permitted. Therefore the most recently constructed heap leach solution ponds (as well as proposed facilities) will be covered to provide wildlife protection. Older facilities will be monitored and any mortalities would be reported to NDOW within 24 hours, as required by permit conditions. Because of the operating conditions for older heap leach ponds and ditches, cyanide levels less than 10 ppm are typical and mortalities are not expected.

RESPONSE TO COMMENT I-10

The following response is quoted from correspondence received from the Nevada Department of Environmental Protection (NDEP), March 25, 1993 (Appendix C).

> The 10-mg/kg action level for soil was contained in an NDEP policy document for closures that is no longer used. There are no levels established in NDEP regulation for WAD cyanide concentrations in soil. The current policy is related to the potential to degrade groundwater which is based on the regulatory standard of 0.2 mg/L WAD cyanide (NAC 445.24342). Current policy practice is to use 10 times this standard as a general guideline for soil cleanups. Site-specific hydrologic conditions are evaluated to determine if cleanup to lower levels is warranted. There is no health risk assessment associated with this guidance policy. NDEP guidance states that when a release of cyanide-bearing solution occurs to soils, the soils containing cyanide should be completely excavated and placed in containment, leaving no residual cyanide in the spill area, or that neutralization take place which reduces WAD cyanide concentrations to below 0.2 mg/L.

RESPONSE TO COMMENT I-11

Applicable groundwater standards for Cortez are related to NAC 445.24342, which states that no facility may degrade groundwater to the extent that the quality is lowered below a state or federal regulation prescribing a standard for drinking water. Applicable groundwater standards are the primary and secondary standards (Profile I). Also included in NAC 445.24342 is the standard for WAD cyanide of 0.2 mg/L.

There are no numeric standards for surface waters at the Cortez site. NAC 445.119, which gives narrative standards applicable to all waters in the state, would apply.

The monitoring plan that would be applicable to the Proposed Action is described on pages 11 and 12 of the Cortez Water Pollution Control Permit No. NEV 00023 (Appendix D). Notification and contingency measures that would be taken if action levels are exceeded in groundwater or soils are summarized on page 2-38 of the DEIS, and pages 5, 6, and 7 of the Water Pollution Control Permit. Detailed notification procedures and contingency measures are contained in the Cortez Emergency Response Plan (March 1993) on file with the Bureau of Land Management in Battle Mountain. For further discussion of contingency measures for spills to soils, refer to Response II-23. Fur further discussion of contingency measures for releases to groundwater, refer to the discussion of the existing remediation pumpback system in Response III-7.

RESPONSE TO COMMENT I-12

A 404 application was filed on October 6, 1992, with the Sacramento District office of the U.S. Army Corps of Engineers. The application includes the placement of fill at five locations in four ephemeral drainages for a total fill of 434 cubic yards or 0.40 acre. A copy of the application and addendum is included (Appendix E). This level of disturbance falls under the Nationwide Permit (i.e., less than 10 acres).

RESPONSE TO COMMENT I-13

Groundwater contamination contours (WAD cyanide) with respect to the existing tailings facility are shown in Appendix Figure C-6 of the DEIS. Location of monitoring and pumpback wells are shown in Appendix Figure C-1 of the DEIS and Figure 4 in Appendix B of this document. Water table contours are shown in Appendix Figure C-3. Water pumped from the remediation pumpback wells is used as quench water at the Cortez roaster facility. This replaces freshwater makeup.

RESPONSE TO COMMENT I-14

Water quality standards for groundwater at the Cortez site are state and federal drinking water standards (see Response I-11). Profile I and II water quality standards are identified on pages 14 and 15 of the permit. The standards applicable to these constituents are shown on NDEP Form 0290, which follows page 15 of the permit. NDEP standards are also presented on pages VI-3 and VI-4 of this FEIS in response to comments from Dr. Miller.

RESPONSE TO COMMENT I-15

Exceedance of any standard listed in the NDEP permit (Appendix D) would be considered a significant impact, assuming that impacted water originally met all standards. According to the NDEP, if monitoring shows that standards are exceeded, the basis for remediation standards is found in NAC 445.24342, which defines degradation. Impacted groundwater which originally met all standards must be remediated to the point where all standards are again met. If the impacted groundwater had specific elements which exceeded standards prior to the current release, remediation standards would be either to the pre-release background level or to a higher level that would not render the water unsuitable for existing or potential municipal, industrial, domestic, or agricultural use. Also refer to NDEP response on pages VI-3 and VI-4 of this FEIS.

RESPONSE TO COMMENT I-16

Until the passage of the Federal Land Policy and Management Act of 1976, as amended (FLPMA), there was no federal-level reclamation responsibility for operations conducted pursuant to the General Mining Law of 1872, as amended. Section 302 (b) of FLPMA [43 USC 1732 (b)] placed a requirement on the Secretary of the Interior to "take all measures required to prevent undue or unnecessary degradation of the Public Lands."

Pursuant to that statutory directive, the Bureau, after a long rulemaking process, finally promulgated rules requiring reclamation of the public lands and proper operational conduct of miners from activities conducted pursuant to the General Mining Law of 1872, as amended. The final rules became effective on January 1, 1981 and are found at 43 CFR 3809.

FLPMA is a civil statute, and as such, its provisions do not go into effect, unless otherwise expressly directed by the legislation, until rules and regulations implementing the provisions of the statute are promulgated pursuant to the Administrative Procedures Act. The final rules (43 CFR 3809) became effective January 1, 1981 and cannot be retroactive, as FLPMA as a statute is prospective in nature. No retroactivity clause is contained in the FLPMA.

Therefore, unless a pre-January 1981 disturbed area is reoccupied by an operator or claimant ("reoccupied" means redisturbed or contained within an approved plan of operations or notice that encompasses a pre-1981 disturbed area), the Bureau has no authority to compel a claimant or operator to reclaim or otherwise rehabilitate the pre-1981 disturbed area.

RESPONSE TO COMMENT I-17

Waste rock dumps and heap leach facilities are not expected to produce acid in amounts exceeding the neutralizing potential (DEIS pages 2-26 through 2-30). Also refer to responses to Comments I-2 and I-3 and Appendix A for static acid-generation and acid-neutralization potential.

In addition, the acid-generating potential of waste rock generated from the Proposed Action would be monitored during mining to determine if additional measures would be required (DEIS page 2-30).

RESPONSE TO COMMENT I-18

Sampling of ore and waste rock is done to ensure that there is no potential to generate acid mine drainage. Monitoring of the site is required to ensure that the facilities associated with the Plan of Operations do not develop unforeseen impacts to surface and groundwater resources from the operation. If necessary, monitoring may extend beyond the actual mining operations and a formal closure plan to prevent long-term environmental damage is required by the Nevada Division of Environmental Protection (NDEP). A financial surety is required to allow the appropriate federal and state agencies to complete reclamation if the company is unable.

Unforeseen problems (due to mining activities) after closure and bond release would most likely be addressed through statutes applying to the media impacted — e.g., Clean Water and Safe Drinking Water acts, federal land management laws, or perhaps the Comprehensive Environmental Response Compensation and Liability Act (CERCLA, or Superfund). The BLM is responsible for management of public lands and the state for private lands after mining ceases and proper closure and bonding requirements are implemented.

RESPONSE TO COMMENT I-19

As identified in response to Comment I-18, the NDEP will require a complete closure plan for the Cortez facility. This closure plan will include a monitoring plan that will ensure that the proposed closure procedures and final results meet the state of Nevada's requirements. These criteria focus on the long-term protection of the waters of the state of Nevada.

The ongoing remediation efforts identified in the DEIS will continue until Cortez has met the NDEP's criteria for the remediation effort [see Dr. Miller's (Sierra Club's) comment (No. 5, pp. VI-3 and VI-4) that includes these standards established by the NDEP].

As stated in response to Comment I-18, ultimately the BLM is responsible for management of public lands and the state for private lands after mining ceases and proper closure and bonding requirements are implemented.

RESPONSE TO COMMENT I-20

Covers for waste rock dumps and heap leach facilities are not proposed because of the lack of acid-generating potential (refer to responses to Comments I-2, I-3, and I-17). Tailings pond decommissioning may include a low-permeability cover (see option 2 on page 2-28 of the DEIS) if tailings are characterized as chemically not stable according to NDEP procedures (page 2-28 of the DEIS).

NDEP regulations (NAC 445.24386) state that post-closure monitoring may not exceed 30 years and is dependent on site-specific and process materials characteristics. Current post-closure monitoring plans consist of phased approaches to monitoring. NDEP currently considers 5-year plans with annual assessment of monitoring needs.

RESPONSE TO COMMENT I-21

The federal and state reclamation and environmental programs have been established to prevent undue and unnecessary degradation of federal lands and to protect nonmineral resources. In Nevada, the BLM and state Division of Environmental Protection have established a joint federal agreement to ensure that mining does not negatively impact surface and groundwater resources. The Cortez Plan of Operations, reclamation plan, and the bond are reviewed and revised to ensure that these resources are protected by federal and state requirements.

Mining is a short-term use of federal land and is managed so that there are no new long-term postmining problems. The Draft EIS analyzes the federal action and effects of past operations. No such future new impacts are anticipated from the Proposed Action.

RESPONSE TO COMMENT I-22

The DEIS is incorrect on page 2-34 where it is implied that only 353 acres would be topsoiled, when the actual topsoiled acreage would be 403 acres. The calculations on page 4-13 of 25 acres is also incorrect. The actual shortfall is 24 acres, as explained below.

Of the 428 acres to be disturbed, 427 acres (1 acre of pit expansion not reclaimed) would require reclamation. Assuming 12 inches of growth medium, about 696,010 cubic yards of salvaged topsoil materials would be needed. The topsoil salvage operation would only provide 650,327 cubic yards of material, or a 45,683-cubic-yard shortfall. Because of the shortfall, 24 acres of slopes would not be topsoiled.

A revegetation strategy to select which areas would be most likely to support successful revegetation and thus would receive topsoil would be based on test plots (e.g., those sited on existing steep slopes). It is also proposed that an additional mitigation measure should be attempted to account for topsoil shortfall. This would involve the use of waste rock fines or chemically stable spent heap leach material amended to serve as growth medium. See also response to Comment No. 26.

RESPONSE TO COMMENT I-23

The Bureau, working as a member of an interagency task force that includes the Nevada Division of Environmental Protection and the Nevada Mining Association, have developed, in draft, "Revegetation Standards for Nevada's Surface Management Program." The review of the product is ongoing, with implementation, including possible changes, to occur in mid-1993.

It is imperative to note that these are draft, and as such, subject to change in the future. That change may be either more stringent or less stringent than the current proposal. Ultimately, whether these criteria or another form of these criteria are adopted by the Bureau and the NDEP, a standard revegetation requirement will be imposed on Cortez for revegetation of the mine site.

The draft standards are included in Appendix F.

RESPONSE TO COMMENT I-24

The third mitigation measure listed on page 4-14 of the DEIS is hereby deleted.

The EPA's interpretation of CEQ regulation 40 CFR 1506.1 is correct. While it is the Bureau's intent to drop this proposed mitigation from the Final EIS, the Bureau wishes to emphasize that this alternative/option will be used in the Pipeline Project EIS (see Section 5.0 of the Draft EIS for details of the Pipeline Project).

There would be several million tons of alluvial overburden generated by the Pipeline Project. This material or other suitable matierals for reclamation/revegetation (e.g., waste rock fines, or chemically stable spent leach materials) would supply Cortez with several opportunities to replace shortfalls of growth medium on this proposed expansion.

The issues the Bureau wishes to emphasize are (1) the EPA's interpretation of CEQ regulations is correct and the proposed mitigation is dropped from the Cortez Gold Mines Expansion Final EIS, and (2) Cortez and the BLM do anticipate the opportunity in the future to have additional resources from existing and reasonably foreseeable projects that will allow reclamation.

RESPONSE TO COMMENT I-25

The area identified as "Tailings" in Figures 2.2-2 and 2.2-3 is the proposed location for Tailings Pond No. 7. Tailings Pond No. 6 is not shown in the figures but is located directly west and adjacent to Tailings Pond No. 7, as shown in Figure C-1 (Appendix C of the DEIS). Tailings Pond No. 6 would be reclaimed upon completion of its use in accordance with specifications outlined in the Reclamation Permit Application for existing Cortez facilities submitted to NDEP and BLM on March 31, 1993.

RESPONSE TO COMMENT I-26

As stated on page 2-28 of the DEIS, an impermeable cap may be required over Tailings Pond No. 7, if tailings are shown to be unstable. Sufficient growth medium above the cap would be required to maintain adequate water-holding capacity to support plant life during dry periods and prevent cracking of the cap. It is likely, as the commentor has noted, that 12 inches of growth medium would not provide adequate water-holding capacity and may not prevent sufficient root zone area to prevent cracking of the cap. Experience has shown that 18 inches of fine- to medium-grained growth medium would be required. Therefore, this would require an additional 65,327 cubic yards of topsoil (i.e., an additional 6 inches of topsoil over the tailings impoundment) that was not accounted for in the DEIS. This would further reduce the amount of topsoil available for use over the remainder of disturbed acreage. If 18 inches of topsoil were placed over the tailings impoundment, an additional 40.5 acres of other disturbed lands would not receive topsoil. This acreage would be in addition to that (24 acres) identified in response to Comment I-22. Under these circumstances a total of 64.5 acres would not receive topsoil. The remainder of disturbed lands would receive 12 inches of topsoil.

As discussed in response to Comment I-22, this shortfall of topsoil may be mitigated by using waste rock fines, chemically stable spent heap leach materials, or other available borrow material, and amending the material to provide growth medium. The applicant would be required to determine feasibility of this mitigation as part of revegetation test plots.

The seed mixture would be adjusted to delete deep-rooting shrubs such as *Purshia*. *Atriplex canescens* shrubs develop radial root systems and would not be expected to penetrate the impermeable caps.

RESPONSE TO COMMENT I-27

There are no dense stands of sagebrush or rabbitbrush on any of the acreage proposed for disturbance. Although pygmy rabbits reside in the cumulative study area (primarily in the Horse Canyon area), they would not be directly impacted by the mine expansions. The DEIS is amended to state that pygmy rabbit habitat could be affected by reasonably foreseeable development in the Horse Canyon area but would not be affected by the Proposed Action. Therefore rabbitbrush is not included in the seed mixture because it is not needed as pygmy rabbit habitat.

RESPONSE TO COMMENT I-28

The seed mixture is a combination of plants designed to stabilize the reclaimed surfaces and native species that would provide forage and cover. The main objective is to provide a diversity of species in the primary community that would set the stage for secondary succession, so that plant communities resembling the indigenous communities could become established in the long term.

TAME TIC
670 KENTUCKY ST
GRIDLEY, CA. 95948
916-846-6352 (FAX) 846-5274

Bureau of Land Management
Battle Mountain, Nevada
March 1, 1993

Dear Mr. Davis:

I am the chairman of the TAME TIC Committee, a non-profit division of the Western States Pipe Trades Council, a building trade union group whose members live and work in the Western United States. TAME TIC devotes its resources to the study of the socio-economic, worker health and environmental impacts of selected construction projects. TAME

TIC and the Council have 50,000 constituents in the Western United States, including hundreds in Nevada, many of whom live in the area near the Cortez mine. These workers have an economic and environmental stake in promoting fiscally sound, well planned developments. TAME TIC is participating on their behalf in the review of the DEIS on the Cortez mine expansion. Please send copies of other comments received on the DEIS, to our consultant, whose address is below. Please continue to send notices regarding Cortez and other mines to Mr. Williams.

Yours,
Jim Wilson by gpr
Jim Wilson

CC: John Williams
12770 SW Foothill Dr.
Portland, OR 97225
503-626-5736 Fax 641-2093

THE CYANIDE HEAP LEACH AND SOLUTION POND METHOD IS INHERENTLY FLAWED AND CAUSES UNDUE DEGRADATION OF THE ENVIRONMENT

A new cyanide heap leach pad is proposed for this facility. But over the last few years, many mine using this technology have experienced releases from the leach pads to the environment. TAME TIC argues that the configuration of this technology; the piling of many tons upon a thin liner, dosing the pile with a toxic chemical, and piping the solution into open pits, is inherently flawed. The liners always leak, the barren/pregnant ponds leak and overflow, and this will always result in cyanide releases to the environment. This is an unacceptable and undue environmental harm. 1

Here is a partial list of facilities that have experienced cyanide releases from their leach pad facilities, either from ripped liners or breaches of pregnant/barren ponds. This list does not include releases from tailings impoundments.

LINER LEAKS
Barrick/Mercur, Utah (liner leak)
Summittville, Colorado (liner leak)
Cyprus Copperstone (liner seam split)
Brohm, South Dakota (liner leak)
Tenneco, Utah (pad overflow, torn liner)
Wharf Resources, South Dakota (pad leak)
Beaver Resources, California (torn liner)
American mine, California ((torn liner)
Yellowjacket Mine, Idaho (pond overflow, punctured liner)
Sumac, British Columbia (leak from heap)

RELEASES FROM SOLUTION PONDS
Cal-Gon Mine, California (pond overflow)
Golden Maple, Montana (pond overflow)
Newmont Cameron Mine, Colorado (pond overflow)
Elk City, Idaho (leak in ditch to pregnant pond)
Sunbeam Mine, Idaho (pond overflow)
Brewer Gold, South Carolina (pregnant pond breach)
Western Mining Hog Ranch, Nevada (barren pond overflow)
Carson Hill, California (broken overflow pipe)
Newmont, Elko, Nevada (barren pond leaked)
Morning Star, Nipton, California (barren pond leak)
Dee Gold, Nevada (broken barren solution pipe)
Portland Mine, Arizona (pond overflow)
Mt. Gaines, Mariposa County, California (solution pond breach)
Gilt Edge, South Dakota (pad overflow)
Piccho Gold, California (breached levee at pad)

Even if the heap leach pad method is used, there are several alternatives to the proposed project that would increase protection for the environment. The project proposes just a single liner for the pad of undescribed thickness. Multiple liners, including a top liner of at least 100 mil, should be required. Thiourea could be used instead of cyanide as a reagent. Drip leaching, as opposed to the suggested spray application of cyanide should be mandated (section 2.3.2). There would be less evaporation of cyanide fumes, and less ponding of cyanide solution on the pad. This would be more protective of wild life and workers. 2

WILDLIFE HARMS FROM THE PROCESS AND TAILINGS PONDS

The EIS should contain measures protective of wildlife regarding process ponds, and tailings ponds, and the leach pad. The EIS mentioned that some fencing and netting would be provided, but it was not clear of all open water ponds at the mine will be netted. Criteria for netting should include but not limited to several alternatives; 1" netting, floating pond covers, 8' tall wildlife fencing surrounds the ponds, or enclosure of these processes within tanks.

Hazing may be used as an alternative to prevent water fowl from entering contaminated ponds. But hazing is ineffective against fowl for two reasons: birds quickly learn that it is not a threat, and exhausted fowl will not pay attention to hazing. 3

Any netting, fencing or other methods to reduce wildlife exposure to at the project's toxic process water and tailings pits should be thoroughly described. These methods should be compared in efficiency and costs to the alternative of tanking these toxic fluids and processes.

The EIS should discuss requiring training of mine personnel in methods of reviving poisoned birds and animals.

THE AGENCY SHOULD NOT REJECT THESE ALTERNATIVES BECAUSE OF ECONOMIC JUSTIFICATION

The alternative of containing toxic mine process water within storage tanks, rather than ponds should be discussed. Storm water would not enter a closed system as readily, reducing the possibility that the system would flood and release process solution. The probability of leaks from open processes, and the costs of clean-up, should be compared with the probability of leaks from enclosed processes, and those clean up costs. 4

For instance, the Ivanhoe mine and the Bond mine in Beatty, Nevada, and Nevada Gold and Viceroy Gold's Castle Mountain mine in California contain their process solutions within wholly enclosed tanks. The Ivanhoe procedure of enclosing its processes in two tanks of 120,000 gallons each is environmentally superior to the Cortez proposal. Ivanhoe's practices also demonstrate that tanking of these solutions is economically feasible.

TAILINGS IMPOUNDMENT

The Cortez tailings will be placed in existing pond #6, and in a new, lined impoundment. But the existing ponds are already leaking. That fact, and the list of lined leach pads provided above, generates doubt that a lined tailings pond will not leak. It is disturbing to read in the DEIS on one page that existing leach pads and tailing ponds are already leaking at this site, and then a few pages to read that the probability of leaks is low for the new leach pads and tailings ponds. We contend that the future releases from the tailings impoundments are very probable and significant impacts, and should be mitigated further in the FEIS. 5

POTENTIAL FOR ACID ROCK DRAINAGE (ARD)

The DEIS states, without providing enough detail to evaluate the claim, that the neutralization capacity of the waste rock and the tailings will prevent ARD. But this theory, has not always worked well in practice. The Richmond Hill mine in South Dakota attempted to "balance" carbonate rock and sulfide rock in a waste pile, to prevent ARD. Now the mine is shut down to prevent ARD that has already killed all fish for 1.5 miles downstream of this mine. 6

Richmond Hill also tried to stop the ARD by adding lime to the waste rock water runoff. But this created a metal precipitate that coated the floor of the stream, further harming aquatic life. A large sediment dam was hastily built to contain the lime-treated water.

SALTS PRESENT IN TAILINGS

Even if ARD does not occur, salts may become concentrated in the tailings piles. For instance:

> "(Mine) wastes ... which do not contain pyrite ... contain dissolved minerals, primarily salts. Although the concentrations of the salts vary, they are usually sufficient to present a problem." [2]

7

The DEIS did not address this salts problem. Even a lined impoundment will allow some leakage. This will degrade groundwater and the environment to unacceptable levels.

ORE AND WASTE ROCK ANALYSIS

The EIS should contain information from meteoric water mobility tests on ore and waste rock from the mine site that is representative of each existing and each proposed source of ore. If there are geologic boundaries that geochemically define one region of an ore body from another region within the same body, a meteoric water mobility test must be performed for each region. If a ore body is geochemically homogenous than the mine owner should provide a statement of such. 8

CONTAMINATION

The DEIS concluded that leaks or releases would not have significant impacts on groundwater. More detail should be provided on this conclusion. How was the migration 9

and geochemical reaction of water moving through the mine, the pits and the tailings piles
calculated? How many aquifers were modeled? How many dimensions were considered?
What boundary conditions were used? What will be the water chemistry after percolating 9
through the tailings pile, and what is the chemical fate of this leachate if it enters the
subsurface and groundwater, springs, and wetlands?

What will happen if the process water pond liner, or ditches, or other containers of
chemicals or solvents fails/leaks? What will be the leakage rate, the concentration of the
solution constituent at the point of leakage and the facility boundary? Where would the 10
leachate solution go? What type of leak detection system will be employed? What are the
proposed long term monitoring plans for the facility?

CLEAN-UP

How will the mine provide funds for cleanup/monitoring/reclamation, following mine 11
closure? How will waste and tailings piles, ponds and ditches be constructed to prevent 12
leakage, discharge to land surface or drainages, and to detect leakage and discharges? The
DEIS says the mine will have enough topsoil stockpiled for the reclamation. This is a 13
significant impact that should be mitigated in the FEIS.

The EIS should describe the mining and industrial compliance record of Cortez' parent
company, including but not limited to the operation of its subsidiaries and the mines and
companies in which it is a partner or major stockholder. This narrative should list all toxic 14
releases by its subsidiaries, or by companies and mines in which it is a partner or large
stockholder, and any violations of rules regarding air and water pollution, toxic clean-ups,
and health and safety violations.

The EIS should contain safeguards to insure that the mine promptly clean-ups and
reclaims its mine site. How will the mining activity affect future and current land uses, 15
including but not limited to tourism, agriculture, timber harvest, geothermal energy, and
recreation? What is the lost revenue from these activities that are curtailed by the mining
project?

BONDING

The EIS should discuss the appropriate size of a bond to finance reclamation of the
mine site, such bond to be posted by the mine developer. Please include a statement of the
applicant's financial condition, including a profit/loss statement, debt to equity ratio and
summaries of annual reports for three years. This information is needed to evaluate the
bonding requirements. 16

The reclamation bond should be at least $6000 per acre of disturbed area.

The EIS did not itself provide a detailed description of the reclamation bond amounts
to be required area by area, as required by BLM rules. Since Cortez will disturb about 248
acres, the bond should be at least $2.6 million.

Other mines have recently been required to post large bonds. The Hayden Hill AMAX mine in California is required to post a bond of $6077 per acre.[3] The Summitville mine in Colorado will require at least $70 million for its reclamation.

LEACH PAD DECOMMISSIONING

17 The pad, upon decommissioning, will rest undisturbed for 4 months to tallow cyanide to degrade naturally. This may not be a reasonable solution. At other mines, cyanide has not naturally degraded as expected. For instance, PEI Associates, a consultant to EPA, reported that a cyanide release near Carlin was still detectable in groundwater 5 years later. [4]

RECLAMATION OF TAILINGS AREAS

18 An EPA-sponsored study of tailings in Montana, found that in some circumstances, metals and contaminants in tailings is capable of capillary action, which means that the metals can migrate upward to the surface of the tailings, and become available on the surface of the tailings piles to erosion from rainfall and snow melt.

This potential problem should be discussed in the FEIS. A map of the monitoring well placement around the tailings area should be included in the EIS.

TOTAL SUSPENDED PARTICULATE (TSP) CONTROLS

19 The haul roads will apparently not be paved (p. 4-4). This is a significant omission because road dust can produce significant amounts of particulate emissions. The DEIS admits that visible dust plumes are created from mine traffic (p. 3-47) Paving of haul roads on the project grounds, at a minimum, would mitigate the project's air impacts during both mine construction, and also during the mines production phase.

Many widely respected industrial engineering sources strongly recommend road paving as a practical dust control measure, despite its expense. For instance, one study prepared for the Federal Environmental Agency states:

> "At active sites ... bulldozers and dump trucks creates most fugitive dust emissions while loading and unloading and transporting the material over roads. Fugitive emissions from mining haul roads ... are most effectively controlled by paving these roads." [5]

The EPA's own publications state that:

> "Common (dust) control techniques for unpaved roads are paving."[6]

We strongly recommend road paving in this instance because of the evidence of high crystaline silica percentages in dust from the proposed Cortez site

The cost of paving, however, is a topic worth comprehensive analysis. A project alternative should be prepared in the FEIS with a detailed discussion of road paving and

Page 7

alternative, less expensive measures of road dust control, and their relative dust control efficiencies. But if the project does not contain paved roads, or equivalent dust controls, then road dust and the entrained cystaline silica emissions, during construction and the mine life, are a significant effect. 19

LARGE PERCENTAGES OF VERY FINE PARTICULATE PRODUCED FROM DRILLING

One important factor in determining the health effect of TSP is the size of the dust; whether it is highly respirable. TSP that is less than 10 microns in diameter is considered particularly dangerous. A recent study found that dust produced by rock drilling produced dust samples with a mean diameter of less than 1 micron in diameter. This means that mine dust produced by drilling will be highly respirable and present an increased health risk for those exposed to it. Amounts of drilling dusts produced should be estimated.[7] 20

IMPACT FROM CONSTRUCTION AND ROAD BUILDING

The mine construction will cause discharges to the air of TSP, oxides of nitrogen (NOx), carbon monoxide (CO), hydrocarbons (HC), and sulfur dioxide (SOx) from windblown and vehicle generated road dust, blasting, vehicle and equipment engines and generators, drilling equipment, and gravel crushing for road building.

The construction and improvement of roads will require thousands of hours of operation of heavy equipment and power tools, including bulldozers, backhoes, graders, chainsaws, and cranes. This equipment will generate additional air pollutants. Surfacing the New and improved roads may necessitate rock crushing operations, which will generate TSP from the crushing, and other air pollution from the equipment engines. But these construction emissions was not calculated, except for dust from blasting.

The engines and compressors that power the roadbuilding and construction equipment should be described, the quantities of each type of engine should be listed, the total hours of operation for these engines should be figured, and the resulting pollution tonnage and concentrations of TSP, HC, NOx, CO, and SOx from those diesel and gasoline fumes should be calculated. 21

The emissions from these sources can be calculated with criteria developed by the Federal Environmental Protection Agency's "AP-42" methods.

DIESEL, GASOLINE, SOLVENT AND PROPANE STORAGE AND USE

The DEIS should say how much diesel, gasoline, and propane fuel will be consumed by heaters, equipment and vehicles monthly and annually, how much of these different fuels are stored on site. how often there are deliveries, and the HC emission rate from the storage tanks, from refueling of vehicles and equipment, and from vehicle and equipment exhaust. 22

SOLVENTS

Mine frequently use solvents and de-greasers for cleaning of equipment. These chemicals may be stored on site and will also evaporate in use and in storage, adding to Hydrocarbon (HC) missions. There may be other chemicals used and stored on site for cleaning of the septic system. The types of solvents should be listed and their use and storage and effects described. 22

23 Mine vehicles will also leak oil and fuel onto the unpaved ground. This impact is not estimated or mitigated. The Stibnite mine in Idaho has severe ground water problems and is facing renewed enforcement action because of diesel spills.

TOXIC AIR POLLUTANTS FROM DIESEL

Since nickel is emitted in diesel (and gasoline and fuel oil) exhaust, the amount of emissions from the mine and associated operations, including nickel and other toxics such as chromium, benzene, benzo a pyrene, and polyaromatic hydrocarbons (PAH) should also be estimated from diesel use and other sources. 24

According to one recent study, floating dusts in ore mines have large surface areas. At mines using diesel vehicles, this dust accumulates high percentages of highly toxic carbon black (1,1-35%). In addition, 3,4-benzopyrene was found in some samples, and other PAHs have been found on mine dust with concentrations 10-15 times higher that those of 3,4 benzopyrene.[1]

VEHICLE EMISSION CONTROL ALTERNATIVES

Alternative low-pollution fuels for vehicle and equipment engines, and dust control measures such as haul road paving, should be discussed. 25

TOXIC AIR EMISSIONS

Mine Safety and Health Administration (MSHA) records show that many metal mine and mill workers become ill from exposure to high levels of lead, solvents, diesel, metals, silica, sulfur dioxide and other air pollutants. For instance, MSHA records on toxic exposure show that some of the Annie Creek, South Dakota mine workers have elevated lead levels in their blood. Lead may be located in the ore at Cortez. So might be zinc, molybdenum, arsenic, mercury, and other metals.

The FEIS should evaluate the potential exposure of mine workers and the public to lead, and other toxic materials as an significant adverse impact of the project. The FEIS should contain a health risk analysis for persons exposed to toxics emitted from the mine. 26

The FEIS should evaluate OSHA 200 logs and MSHA 7000-1 forms that report accidents, injuries and illnesses at mines with processes similar to this proposal to determine what health hazards may be present. This would also assist estimates of the mine's impacts on local health services.

If these materials could cause or contribute to elevated levels of respiratory diseases, cancers, or other ailments, than these illnesses should be listed and described.

The DEIS should include information from local and national cancer registries and state and federal logs of occurrences of respiratory diseases and cancers, showing the current incidence rates for these illnesses in the counties near the Bornite facility.

QUARTZ DUST

For instance, silica (quartz) dust is a probable pollutant from this mine. This substance is recently classified as a probable carcinogen by United Nations health study groups. Nevada lists quartz dust as a hazardous air pollutant.

The amounts of respirable silica to be emitted should be closely studied. Amounts of silica in the ore to be processed, and in addition the amount and percentages of surface-available quartz, should be determined.'

The DEIS did estimate that about 11.6% of TSP emissions at Cortez were silica. The DEIS then calculated that 11.6% of the 16.8 ug/M3 TSP (24 hr. average) would equal 1.95 ug/M3 of silica, which is below the standard of 2.38 ug/M3, and therefore not significant.

We disagree with this analysis. First of all, Mine Safety and Health Administration testing at Cortez has found that as high as 15.5% of TSP is silica dust. Fifteen percent of 16.8 ug/M3 TSP equals 2.52 ug/M3, which would exceed the Nevada standard. 27

Second, the DEIS used both modelling and actual TSP testing at Newmont to extrapolate if particulate levels at Cortez would exceed standards. But the Newmont TSP sampling showed that TSP levels as high as 34 ug/M3 were found near the mine site, in contrast to the 16.8 ug/M3 estimate found by modelling at the Cortez site. If actual TSP levels exceeded 20.5 ug/M3 at Cortez, which is possible given the readings at Newmont, then silica levels would also exceed the 2.38 standard, if silica was 11% of the TSP.

Finally, even if we accept the DEIS math that silica will reach 1.95 ug/M3, that is fully 82% of the Nevada Standard. The consumption of over 4/5th of a standard is a significant impact, even though the standard itself is not exceeded. Adverse health effects could appear in an population exposed to this amount of silica over the long term.

Likewise, the DEIS' showings that TSP and PM 10 standards would not be exceeded. does not necessarily prove that there is not a significant impact from increased TSP and PM 10 emissions. Adverse effects can appear in subject populations below the standards.

BLASTING

Blasting may drive away many animals. During blasting at a hydroelectric project on the Pit River in Northern California, the antelope population abandoned the area, even after blasting ceased. (California Fish & Game, comments to BLM submitted regarding the Hayden Hill gold mine, 1991) 28 Blasting can also cause air pollution and generate toxic substances. This DEIS did state that blasting would generate 1777 tons of particulate matter (TSP). Figuring 36% of the TSP is PM10, which is regulated, this means that blasting will produce 639 tons of PM 10. This is a significant amount of this pollutant, either by itself or 29 in combination with the 200 tons per year of TSP emitted by point sources at the mine, and the 20-odd tons per year of additional fugitive dust from the mine operation.

ANFO CAN PRODUCE CYANIDE AND NITRATE

At the Kennecott Barney Canyon mine in Utah, cyanide is detected in the groundwater, but is upgrade from any mine use of cyanide. The regulating agency and the mine owner state that a complex reaction has occurred triggered by the ANFO explosives, which has produced cyanide in the groundwater there. This possibility should be discussed for the Cortez proposal. In addition, at the Pegasus Zortman mine, nitrate levels increased in nearby surface water. This was in part caused by nitrate residues from explosives that leached into water bodies. [10] 30

THE EA CONTAINED AN INADEQUATE PROJECT AND AREA DESCRIPTION

The EIS did not contain a map for the areas surrounding the project that shows parking areas, on-site temporary housing, staging areas, construction material sources, and toxic and hazardous material handling and storage areas, and wetlands and riparian areas.

The EIS did not contain a cross-section map that compares the proposed mine activity with the aquifers and surface water bodies, and their recharge and discharge areas. 32

The EIS did not list the reclamation costs for different portions of the project. Instead this crucial information was referenced, requiring consultation with other documents. By referencing the reclamation details, rather than including this data in the EIS itself, the EIS may not comply with BLM rules. [11] 33

Please estimate the total projected noise levels at the project site. Blasting, rock crushing and vehicle noise should be included. 34

31

The DEIS is inadequate because it lacked the above elements of a complete project description. These elements are necessary for a reasoned evaluation of the project's impacts. 35

The DEIS should have described the amounts of material that flow into the project (for instance water, ore, reagents, caustic, acid, flocculent, collector, diesel, gas, and hydrocarbons, propane, de-greasers, including septic chemicals, and electricity) and product and byproduct that flow out of the project. (ore concentrate, tailings, waste rock, waste water, grey water, solid waste, septic flow) 36

ENDNOTES

1. Radian Corporation. Environmental Handbook for Cyanide Leaching Projects. Done for the National Park Service. June, 1986. Page 10. See also Copper Dump Leaching and Management Practices that Minimize the Potential for Environmental Releases. Done for the EPA by PEI. May, 1988. PB88-15514. Page 11.

2. PEI Associates, EPA Contract # 68-02-3995, PN-3650-25, p. 15-16 regarding dumps and leach piles. PEDCo, page 95 regarding salts.

3.For the Kennecott bond, see Notice of Intent, Revision of Mining Operations, Kennecott Barneys Canyon Mine. October 1, 1992, on file with the Utah Division of Oil Gas and Mining. For the AMAX bond, see Steffen Robertson and Kirsten. FEIS for the Hayden Hill project. September 1991. page 2-53.

4.EPA Contract #68-02-3995. Gold/Silver Heap Leaching and Management Practices That Minimize the Potential for Cyanide Releases. January, 1988. Trip Report, State of Nevada, based on May 23, 1986 meeting with Nevada DEP. Page 102. See also GAO/RCED 91-145, p 23. "(Cyanide may persist in unacceptable (underground) concentrations."

5. Study of Adverse Effects of Solid Wastes From All Mining Activities on the Environment, PEDCO Environmental, Inc. (Prepared for the US EPA. 1979). Page 143 and 159. Corbitt, Robert A. Standard Handbook of Environmental Engineering. McGraw-Hill, New York. 1990. P. 4.81-.85 for paving alternatives.

6.EPA AP-42 Factors, page 11.21-5. 1988,

7. See ("Size Distribution of Airborne Dust Produced by the Drilling Process. Gueyagueler, Tevfik. Mining Science and Technology. 3 Dec 1991. p. 389-394.)

8. Studies of the Organic and Non-organic Components of Diesel Engine Exhausts absorbed on the ore-mine aerosol Particles. Chebotarev, A. G. Goryachev, N. S. Belan, G. B. Gigiena Truda i Professorinal 'nye Zabolevaniya. 8 August 1991. p. 8-10.

9. See ("Estimating the Quartz-related Fibrogenic Potential of Respirable Coal Mine Dusts." Grayosn, Larry. Harison, Joel. Wallace, William. Simonyi, Thomas. New Technologies in Mine Health and Safety. p. 165-173. 1992.)

10. Environmental Assessment for the Zortman-Landusky Mine Expansion, May 11, 1990, page 60.

11.BLM Instruction Memorandum No. Ca-89-55, referring to 43 CFR 3802 and 3809 requirements. Page 5.

WASTE ROCK DUMP

This dump will be graded at 1.3 to 1. The EIS admits this presents a safety factor less than "1" and is potentially unstable. This is too steep and will increase erosion until it is graded to its final dimensions. We suggest that a slope no steeper that 2:1 be mandated for this dump. The following table lists other mines with waste rock dumps that are graded less steep than 1.3 to 1.

Mine name	angle of slope	structure sloped
Black Pine, Idaho	3:1	waste rock dump, roads, leach pad
Eight leach operations in Montana	3:1	waste heaps
Four Pegasus operations in Montana	2:1	waste heaps
Kettle River, Wash.	2:1	waste rock disposal

DEAR MR. DAVIS:

PLEASE ACCEPT THE CORRECTION OF THREE ERRORS IN THE REMARKS SUBMITTED ON CORTEZ BY TAME TIC. ON PAGE 5, IN THE 4TH SENTENCE OF PARAGRAPH 3, IT SHOULD READ:

"...DEIS SAYS THE MINE WILL NOT HAVE ENOUGH TOPSOIL..."

ON PAGE SIX REFERENCE IS MADE IN PARAGRAPH 3 TO AN EPA STUDY IN MONTANA. THE CITATION FOR THAT STUDY IS:

ENVIRONMENTAL SCIENCE AND HEALTH. "NEW METHODS FOR MODELING THE TRANSPORT OF METALS FROM MINERAL PROCESSING WASTES INTO SURFACE WATERS." BROWN, HENDALL, AND HOSSEINIPOUR, EDWARD. A26(6), 1991. PP. 821-822.

ON PAGE NINE PLEASE SUBSTITUTE "CORTEZ" FOR "BORNITE" IN THE SECOND SENTENCE ON THIS PAGE.

THANK YOU,

JIM WILSON

RESPONSE TO COMMENT II-1

Please refer to response to Comment I-8. This response describes design parameters, leak detection system, and groundwater monitoring network that are all in compliance with NDEP permit regulations. Also refer to Appendix D (NDEP Water Pollution Control Permit), which describes the limitations, requirements, and other conditions authorizing the operation and closure of the Cortez mine.

RESPONSE TO COMMENT II-2

Please refer to response to Comment I-8 for a discussion of the composite liner proposed for heap leach pads. This design is in compliance with NDEP permit conditions.

Use of thiourea as a leaching agent for gold and silver has been investigated by the U.S. Bureau of Mines.[1] These investigations indicate that ores amenable to cyanidation generally give poorer extraction with thiourea and that thiourea will probably find application as a leachant for gold only under special conditions.

If ponding or pooling of process solution on the tops of heaps occurs, the applicant would alleviate the pooling by scarifying and/or drip leaching (refer to page 2-22 of the DEIS).

RESPONSE TO COMMENT II-3

Nevada Department of Wildlife (NDOW), which issues permits for industrial ponds (including cyanide systems) in Nevada, allows tailings ponds to remain uncovered if cyanide concentrations are held below lethal levels. Lethal levels are defined as levels below which no mortality occurs (generally less than 50 ppm). The industrial pond permit states that systems must be in place on open ponds to reduce cyanide concentrations should wildlife mortality become evident. Another permit requirement is that wildlife mortality must be reported within 24 hours to NDOW. Thus, the tailings ponds would be operated under sublethal conditions (typically below 20 ppm) and would not require netting under the NDOW permit unless wildlife mortality indicated otherwise (see Section 2.2.3.1 of the DEIS).

---

[1] Eisele, J.A., A.H. Hunt, and D.L. Lampshire. 1988. *Leaching Gold-Silver Ores with Sodium Cyanide and Thioruea under Comparable Conditions*. U.S. Bureau of Mines.

One-inch netting and 8-foot-tall fencing would be installed for the proposed leach solution ponds.

Cortez mine personnel are familiar with the use of cyanide antidote measures and apply these to affected wildlife when needed (see Section 2.1.7.10 of the DEIS).

Refer to response to Comment II-4 for a discussion of tankage of process water.

RESPONSE TO COMMENT II-4

Where tanks are used to store heap leach solutions, the tanks have been sized to store only the normal operating amounts of process solution. Excess solution resulting from storm events is stored in solution ponds similar to those proposed. Solution pond(s) similar to those proposed are also used to store solution resulting from process upsets requiring tank bypasses. In these instances, not all process solution is expected to be completely stored in a tank. The frequency, duration, and amount of solution stored in the solution ponds is dependent on operational procedures and weather conditions.

Properly designed, constructed, and operated double-lined solution ponds with leak detection which are covered to exclude wildlife provide environmentally safe process-solution-containment systems. The probability of leaks requiring cleanup in a liner system is dependent on the duration and degree of hydraulic head on the liner system, which is relatively constant for the proposed containment system but variable for a system employing tanks. Cleanup costs resulting from leaks in either system will be commensurate with their severity and to a lesser extent their frequency if the systems have equally effective leak detection. The probability and potential cleanup cost associated with the proposed solution containment ponds is not considered to be significantly higher than that which may be expected with a tank system due to the effectiveness of the pond liner and leak-detections system proposed.

RESPONSE TO COMMENT II-5

Any future releases from proposed facilities would be monitored by the proposed leak detection and groundwater monitoring network. Mitigation of potential releases would be accomplished by capturing contaminated groundwater with the pumpback system that is already in place for remediation of the existing plume. The water pollution control wells appear to be effective in controlling the localized plume. The nearest domestic well is located approximately 6 miles away from the localized plume. Because of this distance and the completion of domestic wells in deeper aquifers, the likelihood of impacting groundwater presently being used is low.

RESPONSE TO COMMENT II-6

Please refer to response to Comments I-2 and I-3 and Appendix A for more detail regarding the neutralization capacity of waste rock and tailings.

RESPONSE TO COMMENT II-7

Salts of various compounds often occur in tailings as a result of processing activities. The specific salts that form are dependent on the composition of the host rock. Depending on the solubility of the salts, the distance to groundwater beneath the tailings, and most importantly the presence of a liner, the migration of salts to groundwater and any subsequent migration may or may not cause a water quality problem.

As discussed in the DEIS (p. 2-28), if tailings are characterized as chemically unstable at closure (tested according to NDEP procedures), the surface of the tailings would be covered with an impermeable cap and graded. This would prevent exposure of tailings/salts to meteoric events that could mobilize tailings/salts, thus providing a pathway to groundwater.

In Section 3.4.4 of the DEIS, the presence and remediation of contaminated groundwater is discussed. Through June 1992, 18 groundwater recovery (or pumpback) wells were installed.

These wells are located and operated to capture contaminated groundwater in the vicinity of the ponds. Therefore, if salts were to be present in the tailings and transported to groundwater, they would be collected and removed by the recovery wells. Groundwater from the recovery wells is used as quench water for the roaster to replace fresh makeup water.

RESPONSE TO COMMENT II-8

The Cortez and Gold Acres orebodies are geochemically different. Please refer to Appendix A for meteoric water mobility test results for ore and waste rock from these two areas. Waste rock meteoric water mobility test results for the Cortez area for third quarter 1991 through first quarter 1993 are considered representative of existing and proposed ore and waste rock (Appendix A). For Gold Acres, test results for the period prior to the last quarter of 1992 are considered representative of existing operations. Test results for the last quarter of 1992 and the first quarter of 1993 are representative of the waste rock generated by mining carbonaceous ore at Gold Acres.

The Gold Acres carbonaceous ore would be treated in the Cortez roaster prior to further processing in the carbon-in-leach (CIL) mill. Treatment of the Gold Acres carbonaceous ore in the roaster removes sulfides from the ore and renders the tailings generated from the milling of roasted ore non-acid-generating. Processing of the Gold Acres carbonaceous ore (roasting followed by CIL milling) would produce the majority of tailings resulting from the Proposed Action.

RESPONSE TO COMMENT II-9

Impact analysis for potential releases to groundwater did not involve modeling studies. The new facilities will be designed as zero-discharge facilities that would meet the latest design and regulatory criteria, and would not affect groundwater. As described on page 4-19 of the DEIS, any accidental releases would be detected by monitoring and captured by the existing remediation pumpback network. The conclusion that leaks or releases would not cause significant impact is based on the evaluation that no domestic wells, springs, wetlands, or other surface flow are located within or near the area of the contaminated plume shown in Appendix Figure C-6 of the DEIS.

If this plume receives new releases from the Proposed Action, pumpback procedures would be continued and/or expanded to contain the existing plume.

RESPONSE TO COMMENT II-10

Leak detection and monitoring for process pond water, collection ditches, and their potential sources of leaks or release are discussed in response to Comment I-8. Long-term monitoring plans are discussed in response to Comment I-20.

RESPONSE TO COMMENT II-11

Please refer to response to Comment I-18, second paragraph.

RESPONSE TO COMMENT II-12

The designs of proposed process components are discussed in response to Comment I-8.

RESPONSE TO COMMENT II-13

Please refer to response to Comment I-22.

RESPONSE TO COMMENT II-14

There is no requirement under the National Environmental Policy Act (NEPA) to address these issues. The Bureau's charge under the NEPA is to analyze the direct, indirect, and cumulative impacts of the Proposed Action and any array of "reasonable alternatives" that could meet the objectives of the Bureau under its various mandates, as well as of the proponent's goals.

Secondly, the issues identified by TAME TIC in this comment are overseen by at least one other federal agency, the Department of Labor's Mine Safety and Health Administration. These issues fall under the coverage of the Freedom of Information Act (FOIA), and as such, are "readily available." The NEPA charges all federal agencies to limit the size of environmental documents. This charge includes the need to reduce the size of NEPA documents by (1) limiting the scope of issues to significant issues identified through the scoping process, and (2) not reprinting (copying) public information, laws, regulations, etc., that are "readily available" to the public.

The Bureau feels that the information requested by TAME TIC in this comment meets the "readily available" criteria.

RESPONSE TO COMMENT II-15

Cortez and the Bureau have complied with all current reclamation bonding policies and regulations for the proposal.

As identified in the Draft EIS, the postmining land use is expected to include grazing by livestock and some wildlife values. In addition, mining activity in the forms of exploration and development are expected to continue in the area.

The project area is in close proximity to Cortez' large, existing mining operations. Dispersed recreation such as off-highway vehicle (OHV) use and hunting are limited or nonexistent due to the proximity of the proposal to mining operations. Upon final closure of the mine (with the exception of the open pits), some of this activity would be expected to occur on the reclaimed areas.

To specifically answer the points raised by TAME TIC: (1) Tourism in the area, with the exception of the occasional dispersed recreationist such as a rock hunter, OHV user, or hunter, is extremely limited due to the remote location of the mine. (2) The only agricultural use in the immediate project area is livestock grazing, addressed already in the Draft EIS. Final reclamation will return a large portion of the mine to grazing areas. There is some raising of alfalfa hay northwest of the mine, but none of this area will be impacted by the Proposed Action. (3) There is no merchantable timber impacted by the proposal. (4) The land use planning maps developed for the Shoshone-Eureka Resource Management Plan do show that the entire area around the Cortez Mine property, including Gold Acres to the northwest, does have a high probability of geothermal development. To date there has been little interest shown in exploration for or development of this resource in the vicinity of the Cortez Mine area. There is a geothermal power plant at the Beowawe Geysers, located several miles to the northwest of the existing facilities and proposed expansion. (5) Recreation is most notably in the forms identified in Item (1) of this paragraph.

RESPONSE TO COMMENT II-16

The bond estimate presented in the Draft EIS (page 2-37, $1,780,852.00) represents the bond calculation estimate under the current BLM/Nevada Division of Environmental Protection (NDEP) regulations. The bond estimate applies to the 428 (not 248, as stated in the Comment) acres of proposed disturbance, including the reclamation and neutralization of the cyanide facilities and costs for closure of the proposed cyanide facilities.

Current Bureau of Land Management Washington Office policy authorizes the District Manager, at a proponent's request, to reduce a bond estimate. Nevada Statutes also provide for such a reduction. Numerous considerations are taken into account before the District Manager may reduce a bond estimate. These include the proponent's financial stability, its past performance, and whether a record of noncompliance exists, among others.

Cortez has requested, and the Battle Mountain District Manager has granted, a bond reduction for the current proposal. The original figure of $1,780,852 (page 2-37 of the DEIS) has been reduced to $1,425,624. Therefore, the Bureau has received, approved, and is holding the appropriate bond as currently mandated by Bureau policy and regulations. Copies of the bond determination and the Bureau's acceptance letter are available on request.

Cortez, as required by the BLM and the Nevada statutes that went into effect on October 1, 1990, has submitted a reclamation plan and bond estimate to the Shoshone-Eureka Resource Area, Battle Mountain District of the BLM for the remainder of the facility. To be in compliance with these regulations, a reclamation bond for the entire facility must be in place by October 1, 1993.

Cortez has submitted, and the Bureau has approved and is holding, the bond for this expansion project. The Plan approval is enclosed with the Final EIS and Record of Decision. By state of Nevada and Bureau regulation, the Plan may not be approved until the bond is approved and in place. With the bond in place, the financial condition of the company is not relevant to this discussion. The Bureau has the financial surety in place that will pay for the reclamation of the proposal as directed under current regulation and policy, regardless of Cortez' or its parent company's financial condition.

The Draft EIS must contain sufficient detail from the submitted Plan of Operations to allow the public and the Authorized Officer to understand the possible impacts from the proposal, including the reclamation of the project. The Bureau feels that the Draft EIS contains that detail.

The area-by-area computations are included in the Plan of Operations submitted by Cortez, thus meeting these requirements. The approved Plan of Operations is public information, i.e., "readily available" (see response to Comment II-14).

Finally, the bond estimate presented in the Draft EIS meets all the legal criteria currently established by the Bureau and the NDEP.

RESPONSE TO COMMENT II-17

As discussed in Section 2.2.7.3 of the DEIS, the leach system would be allowed to rest undisturbed for about 4 months to allow WAD and free cyanide to degrade naturally. It is uncertain how much of the cyanide would degrade during this time period. As discussed further in this section, the heap leach pad would be flushed with fresh water as long as concentrations of free and WAD cyanide were decreasing and until NDEP permit standards were reached. If repeated periods of flushing and rest were not adequate to decrease cyanide concentrations, alternative decommissioning procedures would be discussed by the applicant with NDEP. For example, alternative procedures could include the use of a cyanocide such as hydrogen peroxide to reduce cyanide to an acceptable level for closure.

RESPONSE TO COMMENT II-18

It is unclear whether the conditions found in the Montana study are similar to those in the tailings at Cortez and, therefore, whether the interpretations of the results of that study are applicable to this project. Staff at NDEP are unfamiliar with capillary action as being a mechanism for any significant transport of dissolved metals from tailings piles to ground surface. Section 2.2.7.4 of the DEIS discusses the decommissioning of tailings ponds. In accordance with NDEP requirements, representative samples of tailings would be analyzed for chemical stability under the ambient environmental conditions at the facility. If the tailings were not chemically stable, the applicant would use a low-permeability cover (see Option 2 in Section 2.2.7.4). If transport of metals were to occur by this mechanism, NDEP would require stabilization measures to be undertaken (e.g., a coarse-grained layer to block capillary action). Also refer to responses to Comments I-2 and I-3, which explain why acid generation is not considered to be a concern with respect to the tailings.

Monitoring-well placement around the tailings area is shown in Appendix Figure C-6 of the DEIS. Monitoring is also planned for Tailings Pond No. 7 and the proposed Cortez heap leach facilities (Appendix B).

RESPONSE TO COMMENT II-19

Activities at the mine that would generate fugitive dust, such as travel over unpaved haul roads, are regulated under NDEP Surface Disturbance permits. The Surface Disturbance permit requires that fugitive dust from haul roads be controlled with water and chemical dust suppression (e.g., magnesium chloride). Both watering and chemical suppression would be applied in accordance with NDEP guidelines. These measures are considered adequate to mitigate impacts, and paving of roads is not considered necessary.

An analysis of emissions of crystalline silica is presented in the DEIS in Section 4.1.4. These emissions are associated with the grinding mill, the fluid bed roaster, and the primary and secondary roasters. The analysis reveals that the 8-hour crystalline quartz concentration would be below the ambient standard and would therefore not be a significant impact.

RESPONSE TO COMMENT II-20

EPA emission factors for mining processes indicate a potential for uncontrolled particulate emissions of 1.3 lb per hole drilled.[2] However, water injection would be used during mine expansion and exploration drilling on all blast holes, to reduce particulate emissions to below a level of significance. In addition, drillers are required to wear respirators, so inhalation of fine dust would be unlikely.

---

[2] U.S. Environmental Protection Agency (EPA). 1985. *Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, OAQPS*. Research Triangle Park, NC. NTIS PB86-124906.

RESPONSE TO COMMENT II-21

Table 1 (Appendix G) lists the type, quantity, and hours of operation of equipment used in construction. Emissions of particulate matter (PM), hydrocarbons (HC), carbon monoxide (CO), nitrogen oxides (NO_x), and sulfur dioxide (SO_2) from construction equipment exhaust are also summarized in Table 1 (Appendix G). These emissions were calculated using emissions factors for heavy-duty diesel-powered construction equipment contained in the EPA document AP-42 Volume II, which is a compilation of emissions factors for mobile sources. All heavy-duty construction equipment is diesel-powered.

Emissions are provided on a monthly and daily basis, based on a mining schedule of two 10-hour shifts 4 days a week and one 10-hour shift 3 days a week. This schedule is not expected to change significantly throughout the lifetime of the project.

RESPONSE TO COMMENT II-22

Table 2 (Appendix G) summarizes the following information regarding storage and use of fuels on site:

- Amount of diesel and gasoline consumed monthly and annually
- Amount of these fuels that are stored on site
- Annual usage and storage quantity of solvents
- Hydrocarbon emissions from storage tanks of these fuels
- Hydrocarbon emissions from the refueling of vehicles

Propane tanks are pressurized. There would be no evaporative emissions from these tanks, so they are not included in Table 2 (Appendix G).

Evaporative hydrocarbon emissions from fuel storage tanks and from the refueling of vehicles were calculated using emission factors in AP-42 Volume I, which is a compilation of emission factors for stationary sources. Hydrocarbon emissions from diesel-powered equipment exhaust are included in Table 1 (Appendix G).

RESPONSE TO COMMENT II-23

The NDEP Air Quality Program regulates the emissions of volatile organic compounds from contaminated soils. Regulation is triggered by the size of the spill. This program stipulates that treatment of contaminated soils must be accomplished by a facility or treatment process which is fully permitted. It is proposed that soil contaminated by leaked or spilled fuel would be disposed of by burning in the Cortez roaster, for which a permit application has been initiated. Alternatives for treatment of hydrocarbon-contaminated soils include on-site incineration in a fully permitted portable incinerator or off-site incineration at a fully permitted facility. If such disposal is not permitted, it is proposed to treat the contaminated soil on site with a biopile. A biopile is a soil pile that relies on microorganisms to degrade contaminants into carbon dioxide and water. A liner would be placed underneath and around the biopile to avoid exposure to air and completely contain contamination within the biopile.

RESPONSE TO COMMENT II-24

Emissions of particulate and organic toxic compounds from diesel exhaust are summarized in Table 3 (Appendix G). Hydrocarbon and particulate matter emissions from diesel exhaust (Table 1 in Appendix G) were used to calculate emissions of toxics in diesel exhaust. Percentages of toxic constituents in diesel hydrocarbon and particulate matter emissions were obtained from EPA speciation profiles. Those toxics for which there was information in the profiles, and which had TLVs in the Occupational Exposure Values compiled by the American Conference of Governmental Industrial Hygienists, are presented in Table 3 (Appendix G).

RESPONSE TO COMMENT II-25

According to manufacturer representatives of Cortez mining equipment, alternative equipment utilizing lower-pollution fuels and having the required horsepower is not available, either as new equipment or by the modification of existing equipment.

Cortez believes that even if such equipment were available, it is likely the requirement to replace or retrofit existing mine equipment would render the Proposed Action, which is an incremental expansion of an existing operation, economically nonviable.

Haul road paving is not proposed under the Proposed Action for reasons presented in response to Comment II-19.

RESPONSE TO COMMENT II-26

Worker health and safety is protected by worker air quality and physical monitoring practiced by Cortez. The Mine Safety and Health Administration (MSHA) conducts routine site inspections at least every 6 months. As part of its inspections, the mine's worker air quality monitoring program records are reviewed. These records include the following:

- There is a quarterly urinalysis of employees working in the mill (including refinery), dry grind building, roaster, and assay lab.

- The blood lead levels of assay lab personnel are checked quarterly. Samples are collected and analyzed by the Elko Regional Medical Center. In situations involving pregnant female employees in the assay lab, the frequency of evaluations is increased to monthly.

- MSHA checks worker exposure to air contaminants at least annually, typically for silica only, but can check for other toxics if they have a specific concern. They can also check more frequently if they have a concern.

These air quality and physical monitoring records are maintained and reviewed in order to prevent worker exposure to high levels of contaminants. Levels of contaminants found in the air samples, blood levels, and urine samples are compared to Threshold Limit Values (TLVs) compiled by the American Conference of Governmental Industrial Hygienists. If the contaminant levels in these samples get close to the TLV, the worker is removed from the area. Therefore, the potential exposure of workers to toxic materials is avoided.

Monitoring records — e.g., the OSHA 200 and MSHA 7000-1 forms — are subject to Freedom of Information Act requests and, as such, are readily available to the public upon request. In order to keep the EIS to a reasonable size, the Bureau is directed by CEQ regulations to limit the reprinting of information that is readily available to the public through other sources. (Also, see response to Comment II-14.)

Worker-protection equipment that is available is identified in the Respirator Program included in Appendix H. This program is implemented with a program of employee training in the application and use of the equipment. On-site health and safety personnel provide the training and audit the proper use of the equipment by employees. This equipment is also available to blasthole drillers.

Exposure of mine workers to toxic materials is monitored and regulated with the above health and safety practices. Exposure of the public to toxic materials is unlikely, because the closest residence is in Crescent Valley, which is 5 to 10 miles from expansion activities. This is outside the range of modeled impacts of criteria pollutants from the mill. Impacts from toxic contaminants would not occur outside this range.

RESPONSE TO COMMENT II-27

Modeled Concentrations

When ore is broken down during crushing and grinding, crystalline silica can be emitted. Sources at the Cortez ore processing facility that could produce emissions of quartz include the crushing circuit, grinding circuit, and the roaster. An air quality standard exists for the quartz form of crystalline silica, 2.38 $\mu g/m^3$, for an 8-hour average concentration.

Concentrations of particulate matter modeled by NDEP were used to estimate concentrations of quartz from the above sources at the mill. The combined 24-hour particulate matter concentration from these three sources was calculated as 6.63 $\mu g/m^3$. This was converted to an 8-hour concentration, using EPA screening-level factors, of 11.6 $\mu g/m^3$. This allows comparison to the 8-hour crystalline quartz standard of 2.38 $\mu g/m^3$.

Dust samples taken at the Cortez mill were used to estimate the percentage of quartz in the ore dust. Three dust samples were taken by placing personal samplers on the crusher operator, the grinder operator, and the loader operator. The highest percentage of crystalline quartz found in these samples was 15.6 percent of respirable dust. It was conservatively assumed that the highest of these represented the amount of crystalline quartz in the particulate matter emissions. When the 8-hour particulate matter concentration of 11.6 $\mu g/m^3$ is multiplied by 15.6 percent quartz in the dust, the resulting concentration is 1.81 $\mu g/m^3$ of quartz, which is below the standard of 2.38 $\mu g/m^3$.

This standard is for comparison with concentrations of quartz in respirable dust — that is, dust or particulate matter that has a diameter of 10 micrometers or less. The particulate matter that was modeled by NDEP includes emissions of total suspended particulates (TSP). Particulate matter of a 10-micrometer diameter (PM_{10}) would represent a fraction of the TSP. Therefore, the 8-hour modeled TSP concentration of 11.6 $\mu g/m^3$ is conservatively assumed to be entirely respirable dust.

Monitored Concentrations

Monitored PM_{10} data taken from the Newmont Gold Quarry site were presented in the DEIS to illustrate that local concentrations of PM_{10}, at a mine at which similar activities to those at Cortez are ongoing, are below ambient air quality standards. These monitored PM_{10} levels include both background PM_{10} from various sources and project-related PM_{10}.

The monitored data at Newmont Gold Quarry include contributions to PM_{10} from various sources, including fugitive and combustion sources, that may not contain crystalline quartz. It is likely that background levels would be the major contributor to the monitored PM_{10} levels. It is therefore inappropriate to compare these monitored data to the ambient standard for quartz.

RESPONSE TO COMMENT II-28

Blasting effects from the Proposed Action would be minimal because (1) the wildlife densities are low in the surrounding habitats, (2) critical habitat is not located within or nearby the blasting area, and (3) surrounding habitat is not confined by terrain and allows for movement away from the noise source.

RESPONSE TO COMMENT II-29

Emissions of particulate matter from blasting and from other sources of fugitive dust cannot be mitigated any further than that which is discussed in the Mitigation section of the DEIS. The Newmont Gold Quarry PM_{10} monitoring data were presented in the DEIS to show that fugitive-dust-generating activities at Cortez, which are similar to those at Newmont, would be unlikely to contribute to a violation of the ambient PM_{10} standard.

TSP emissions from point sources at the mill are NDEP-permitted emission levels. Furthermore, dispersion modeling results using these emission levels show no violation of the Nevada ambient air quality standard from the combined impact of all point sources at the mill.

RESPONSE TO COMMENT II-30

The detection of low concentrations of cyanide in water at the Barneys Canyon mine in Utah has been documented by the operator and reported to the Utah Division of Water Quality. The cyanide is believed to be generated by ammonium nitrate (fertilizer)/fuel fertilizer oil (ANFO) explosives used in blasting ore and waste rock beneath the water table in one of the mine's open pits. This apparently occurs as the fuel oil and ammonium nitrate react explosively, releasing carbon and nitrogen compounds, respectively, which, in turn, may react in the presence of water to form low concentrations of cyanide compounds which are stable for a short time in the standing water in the pit.

At the Barneys Canyon mine, low concentrations of total cyanide have been observed in a dewatering sump in an open pit which has been advanced to a depth below the local water table. Cyanide is detected in the sump over short time periods following blasting events; however, cyanide levels do not generally exceed proposed Utah groundwater quality standards. Concentrations of total cyanide have been found to decrease rapidly following blasting and commonly reach undetectable concentrations if blasting has not recently occurred. Monitoring of existing monitoring wells downgradient from the pit has not identified detectable total cyanide concentrations.

Formation of cyanide compounds during blasting by this apparent mechanism requires that groundwater be present to provide the medium in which the nitrogen and carbon compounds can become dissolved. Therefore, it would not be anticipated to occur in the expansion of open pits at the Cortez operations because the projected ultimate pit depths would be above the water table. In addition, the Utah mine example indicates that low concentrations of the cyanide compounds, as expected, are not stable in the non-alkaline waters of flooded or dewatered open pits, and, therefore, are expected to quickly degrade to non-detectable levels in such situations. For these reasons, no impact to groundwater quality as the result of using ANFO explosives during expansion of proposed Cortez open pits is predicted.

The absence of both shallow groundwater and nearby surface water in the vicinity of the proposed Cortez open pits would result in minimal potential impact to water quality from any other compounds that may be formed during blasting.

RESPONSE TO COMMENT II-31

All of the existing and proposed facilities, staging areas, and parking areas referred to in this comment are located at the Cortez and Gold Acres areas shown in Figure 1.1-2. More specific descriptions of locations are provided below.

Employee transportation is provided in the form of vans and a bus. Therefore, limited parking is all that is needed. Supervisory vehicles are parked adjacent to the Cortez Administrative Office, Maintenance Shop, and Roaster Administrative Office. Limited visitor parking is provided adjacent to the Cortez Administrative Office. The Cortez facilities described above are located within the existing disturbance area southwest of the Leach Area depicted in Figure 2.1-1 in the DEIS.

Supervisory vehicles are also parked at the Gold Acres Maintenance Shop. The Gold Acres Maintenance Shop is located adjacent to the southwest corner of the Gold Acres Leach Area shown in Figure 2.1-2.

Construction staging areas for Tailings Pond No. 7 and the Cortez Heap Leach Pad would be within the disturbance area depicted for these facilities in Figure 2.1-1 and within the area of existing disturbance also depicted on this map.

Construction staging areas for the Gold Acres Heap Leach Pad would be within the area of disturbance depicted for this facility in Figure 2.1-2 or within the Gold Acres Maintenance yard adjacent to this area.

Construction material sources would be within the areas of disturbance for each facility depicted in Figures 2.1-1 and 2.1-2 and within the areas of existing disturbance also shown on these maps.

There is no on-site temporary housing at either Cortez or Gold Acres.

Hazardous material handling and storage areas are located as follows:

- Petroleum products and fuels. Bulk oil and fuel storage is located at the Cortez and Gold Acres Maintenance Buildings. Bulk diesel fuel storage is also located at the Cortez Roaster.

- Process Reagents, i.e., cyanide, caustics, liquid oxygen. Process reagents are handled and stored at the following locations:

    - Cortez Roaster (liquid oxygen)
    - Cortez CIL Mill (cyanide, caustics)
    - Cortez 91C Process Area (cyanide)

No process reagents are currently stored or handled at Gold Acres. Cyanide and caustics would be stored and handled within the Gold Acres Heap Leach Area shown in Figure 2.1-2.

No wetland or riparian areas are located in areas that would be impacted.

RESPONSE TO COMMENT II-32

Figure C-2 of Appendix C in the DEIS is a generalized geologic cross section through the facility that shows the features referred to in this comment. The figure illustrates mine activities (heap leach pile, pregnant solution pond, and tailings pond and embankment) in relation to shallow groundwater. Since no perennial surface water bodies are located in the mine vicinity, none are shown. The cross section was drawn in the direction of groundwater flow. The figure shows an area with groundwater occurring at higher elevations on the southeast or right-hand side of the figure and lower groundwater elevations on the other side. Therefore, groundwater is shown to flow from the right-hand side of the figure towards the left (or from the southeast towards the northwest). In cross-section view, these flow directions represent groundwater recharge and discharge areas. These groundwater flow directions (and recharge/discharge areas) are consistent with the water table contour map (see DEIS Figure C-3) in the vicinity of the heap leach pads and tailings ponds (see DEIS Figure C-1).

RESPONSE TO COMMENT II-33

The Instruction Memorandum referenced by TAME TIC is a California BLM requirement. Any requirements outlined in this memorandum are from the California State Director to California districts. It is not Bureau-wide direction.

As noted in response to Comment II-16, the Draft EIS provides sufficient detail to understand the goals of and the impacts resulting from the proposed reclamation. The area-by-area computations are required to be in the Plan of Operations, not the EIS. The area-by-area costs do not change the impacts of or likely success of the proposed reclamation.

RESPONSE TO COMMENT II-34

The major sources of noise from the Proposed Action would be the same as the current sources from the existing mining and processing operations: rock drilling, blasting, loading of rock and ore, truck hauling, ore crushing, milling, and ore handling and distribution.

The large geographic spread of the Proposed Action facilities suggests there would be several focal points of activity generating noise. Estimated worst-case noise levels from these activities would be approximately 96 dBA at a 50-foot reference distance. The closest receptor would be the Wintle residence, which is located roughly 6 miles from both the Gold Acres area and the Cortez area. At this distance, the receptor would not likely experience any perceptible changes in ambient noise levels as a result of the Proposed Action.

The highest noise levels to which on-site personnel would be exposed would occur in the pit, the crushing areas, and within the mill building. The highest noise levels in these areas would range from approximately 80 to 95 dBA. On-site personnel are required by MSHA regulations to wear hearing protection in high-noise-level areas.

RESPONSE TO COMMENT II-35

The additional information requested above has been supplied. In those cases where data were already available in the DEIS (including appendix material), references have been noted.

RESPONSE TO COMMENT II-36

Raw materials consumed, cycled, or disposed of by the project — e.g., water, ore, soils, waste rock, tailings, or other materials that have the potential for environmental impact — were included in Section 2.0 of the DEIS. Specifically, refer to Sections 2.2.2.3, 2.2.2.5, 2.2.3.1, and 2.2.3.2.

Working for the Nature of Tomorrow

NATIONAL WILDLIFE FEDERATION

1400 Sixteenth Street, N.W., Washington, D.C. 20036-2266 (202) 797-6800

March 1, 1993

Bureau of Land Management
Battle Mountain District Office
Attn: Dave Davis, Team Leader
P.O. Box 1420
Battle Mountain, NV 89820

RE: Cortez Gold Mines Expansion Project Draft EIS.

Dear Mr. Davis:

We are writing to provide the National Wildlife Federation's comments on the Draft EIS for the proposed Cortez Gold Mine Expansion Project in Lander and Eureka Counties, Nevada, in the Shoshone-Eureka Resource Area.

The National Wildlife Federation (NWF) has a number of concerns with the Draft EIS which need to be more thoroughly addressed to fully protect resource values in the immediate and general vicinity of the proposed mine expansion project. The Federation's concerns include the following:

1. Reclamation Bonding
2. Environmental Monitoring and Bond Release
3. Threatened and Endangered Species Protection
4. Natural/Native Vegetation
5. Containment Ponds and Wildlife Exclosures
6. Surface Hydrology
7. Subsurface Hydrology
8. Post-mining Topsoil Distribution
9. Waste Rock Dump
10. Pit Backfilling

1. Reclamation Bonding

Given the costs and complications associated with heap-leach mining -- surface- and ground-water contamination, pit backfill costs, vegetation restoration, unforeseeable engineering difficulties, and environmental and wildlife impacts -- National Wildlife believes that the estimated reclamation surety amount of $1,780,852 is insufficient to ensure the State and the BLM's ability to deactivate, reclaim, stabilize, and restore the Project Area in the event that Cortez should become unable to fulfill the terms and conditions of the final plan. National Wildlife recommends 1 that the bonding study be re-evaluated utilizing worst-case assumptions and scenarios as the basis for determining the appropriate bond amount. 1

2. Environmental Monitoring and Bond Release

The National Wildlife Federation believes that the final reclamation bond should not be surrendered, in full or in part, until a period of not less than ten years after final and successful completion of planned reclamation activities on the project site. The ten year window would provide a period of time in which to monitor plant communities and to be certain of future plant growth and successful soil and surface stabilization. 2

The ten year window will also provide BLM and the State of Nevada the opportunity to respond to unforeseen problems and to ensure that revegetation and reclamation are adequately completed prior to release of the bond. Similarly, we suggest that a substantial portion of the bond be retained -- or that a separate bond be posted -- to address future and ongoing groundwater monitoring, protection, and treatment needs.

3. Threatened and Endangered Species Protection

National Wildlife is concerned about the potential impact of the proposed project on wildlife and wildlife habitat. In the Summary of Impacts, the Draft concludes that

> [r]emoval of moderate to low quality wildlife habitat and indirect impacts due to traffic, noise, and human presence are not considered significant. . . . No critical wildlife habitat or species would be affected.[1] 3

However, the Draft later identifies a number of wildlife species which could be adversely impacted by the proposed mining activities. Specifically, Chapter 3, Affected Environment, identifies a number of "Candidate, Category 2"[2] species within the study area, including loggerhead shrike and pigmy rabbit. In addition, the Draft identifies Golden Eagle,

---

[1] Cortez Expansion Draft EIS, p. ix.

[2] Cortez Expansion Draft EIS, p. 3-39.

Ferruginous hawk and unidentified (but possibly threatened or endangered) species of dace as also being present.

a. Pigmy Rabbit

In Chapter 4, "Environmental Consequences," however, the Draft concludes that

> [t]wo Candidate, Category 2 species could be affected by the proposed action. The Pigmy Rabbit, while not observed during field surveys, may occur in denser shrub (particularly rabbitbrush) habitats, or in sage habitats in rocky areas. **Destruction of a part of a habitat unit utilized by this species may result in the elimination of a local population. Such an impact would be locally significant.** [emphasis added].

National Wildlife is concerned that the Summary conclusion that "no critical wildlife habitat or species would be affected" rather plainly contradicts the latter finding that "such an impact [on Category 2 species] would be locally significant." The Federation suggests that a comprehensive field survey be undertaken in consultation with the United States Fish and Wildlife Service to ascertain the pigmy rabbit population in the affected area and to determine whether and to what extent expanded mining activities would affect this species. 3

b. Fisheries

The proposed plan indicates that Indian Creek, located roughly NNW of the Gold Acres Facilities, contains populations of dace and shiners.[3] According to the Federal Endangered Species list,[4] Nevada lies within the historic range of five species of threatened or endangered dace, including the Ash Meadows Speckled Dace (*Rhinichthys osculus nevadensis* - Endangered), the Clover Valley Speckled Dace (*Rhinichthys osculus oligoporus* - Endangered), the Desert Dace (*Eremichthys acros* - Threatened), the Independence Valley Speckled Dace (*Rhinichthys osculus lethoporus* - Endangered), and the Moapa Dace (*Moapa coriacea* - Endangered).

---

[3] Cortez Expansion Draft EIS, p. 3-38.

[4] 50 CFR 17.11 & 17.12.

The National Wildlife Federation suggests that Cortez and the BLM consult the Fish and Wildlife Service to determine whether these or other threatened or endangered species are present in the Project area. If any of these species is present, the Federation suggests that closer scrutiny be given to anticipate the potential adverse impacts of the proposed expanded mining operations.

c. Golden Eagle 3

The proposed plan also states that Golden Eagles are present in the study area. This being the case, any adverse impacts to local eagle populations may require a takings permit to be issued by the U.S. Fish and Wildlife Service under the Bald Eagle Protection Act[5] and/or the Migratory Bird Treaty Act.[6] National Wildlife suggests, therefore, that the Fish and Wildlife Service also be consulted regarding the presence of Golden Eagle in the Project area.

4. Natural/Native Vegetation

Since native plant communities will have the greatest potential for rapid and vigorous reestablishment in the Project Area, National Wildlife suggests that the native plant communities to be disturbed by the proposed mining activity be carefully removed, replanted, and maintained under similar site conditions away from the disturbed area. Used in the reclamation process, native vegetation will promote the re-establishment of soil microbes and nutrients, and enhance soil stabilization and recovery of the native plant community through natural re-seeding. 4

The Proposed Plan states:

> "All of the reclaimed surfaces would be revegetated to control runoff, reduce erosion, provide feed for wildlife and livestock, and reduce visual impacts . . . The seed mixture that would be applied upon reclamation . . . reflects the goals of post-mining land uses of grazing and wildlife habitat by

---

[5] 16 U.S.C. 668-668d.

[6] 16 U.S.C. 703-712.

> **providing forage and cover species similar to the pre-disturbance conditions**" [emphasis added].[7]

If the goal of revegetation is to establish "**forage and cover species similar to the pre-disturbance conditions,**" National Wildlife questions the Recommended Revegetation Seed Mixture (Table 2.2-3, attached). According to Tables 3.5-5 and 3.5-6, Vegetation Communities By Species, Cortez and Gold Acres (also attached), the dominant vegetation communities at Cortez and Gold Acres include the Greasewood, Shadscale/Bud Sagebrush, Sagebrush/Grass, and Juniper plant communities. However, of the nine recommended revegetation species, only two -- *Elymus cinereus* (basin wildrye) and *Sitanion hystrix* (bottlebrush squirreltail) -- are members of the described native vegetation communities.

The remaining seven recommended revegetation species are non-native and have greater value as livestock forage than wildlife forage; the suggested re-seeding mixture, therefore, favors livestock grazing at the expense of wildlife. In addition, while Ladak alfalfa (*Medicago sativa*) is valuable as a soil nitrogen fixer for soil improvement, its high water needs would require extensive irrigation in an arid environment which may render it impractical or inadvisable. The plan makes no mention of proposed irrigation activities and whether or not this species is intended to be part of the permanent vegetative cover or short-term solution to soil stabilization. 4

If the goal of using the Recommended Revegetation Seed Mixture is to provide soil stabilization in the near term, then the Federation is not opposed to its use, provided that the seed mixture be augmented with perennial native plant species and that short and long-term strategies for native vegetation recovery be specifically described, stating that the non-native, fast-growing species in the proposed re-seeding mixture would be used only for soil-stabilization in the near term. A long term strategy should be identified to assist in the full recovery of native flora. In addition, it is critical that reclamation bonds be held for a ten year period to ensure permanent revegetation success.

The Federation remains concerned, however, that the primary purpose of the reseeding mixture is to provide enhanced forage and grazing conditions for domestic livestock. We strongly suggest that the use of native plant species be emphasized in all revegetation practices and that the recommended revegetation mixture more accurately reflect the goal of "providing forage and cover species similar to the pre-disturbance conditions." 4

---

[7] Cortez Expansion Draft EIS, p. 2-35.

5. Wildlife Exclosures and Toxicity Levels

The proposed plan is unclear regarding wildlife exclosures. The plan states that

> . . . [C]yanide concentrations in the proposed tailings pond . . . would be maintained below acute toxicity levels for waterbirds and other terrestrial wildlife that could contact water in the pond. Also, leach ponds would be fenced and netted to exclude terrestrial wildlife.[8]

The Federation recommends that wildlife access to all tailings and leach ponds be restricted.

While efforts may be made to maintain the tailings ponds below acute toxicity levels for waterbirds, every effort should be made to prevent all wildlife access to the tailings ponds as well. Physical barriers such as fencing and netting should prevent ground access while additional means should be implemented to prevent waterfowl and nesting birds from entering the tailings pond area. 5

In addition to the tailings pond and leach pond areas, the leach heap itself should be constructed and maintained to prevent pooling of water on the heap that might attract wildlife. While the plan indicates that fencing and netting will be placed around the leaching ponds, the plan should more specifically address the methods to be used to keep wildlife and waterfowl away from acute or chronically toxic solutions and substances, whether they be in tailings ponds, leaching ponds, or elsewhere.

6. Surface Hydrology

The National Wildlife Federation is concerned about the potential for tailings pond blowout events. While 50- or 100-year precipitation events are rare, they are as unpredictable as they are unlikely. Every precaution should be taken to 6 ensure the stability and protection of the leach ponds and tailings ponds and dams against such an event.

---

[8] Cortez Expansion Draft EIS, pp. 4-25 to 4-26.

In addition, while surface water resources in the Cortez Project area may be seasonal or intermittent, the Federation nonetheless recommends that precautions be taken to prevent alteration or disruption of historic or seasonal drainages in the project area and that surface drainages - whether seasonal or perennial - should be protected from sedimentation, heavy metal deposition, and acid contamination. 6

7. Subsurface Hydrology

The National Wildlife Federation is also concerned about the potential effects of subsurface water drawdown. The projected groundwater consumption rate of 1,174 acre-feet per year (Table C-6, p. C-17), poses a potential impact on the future quality and available quantity of local groundwater resources. Groundwater depletion may have a local impact on wetland resources in the study area, particularly if those wetlands function as groundwater discharge areas. Therefore, every effort should be made to reduce ground water consumption as much as possible.

In addition, if the ore pits accumulate water as a result of subsurface drainage, then any loss of groundwater through evaporation from the pit should be charged against Cortez' groundwater consumption permit. 7

Finally, the plan states that a WAD cyanide plume exists in the Cortez vicinity as a result of contamination from past ore processing activities. National Wildlife suggests that the contaminated groundwater resources in this area be used in the current and proposed ore processing activities. Drawing process water from currently contaminated groundwater supplies would simultaneously provide the opportunity to treat the contaminated groundwater and retard migration or expansion of the existing WAD plume.

8. Post-mining Topsoil Distribution

The Proposed Plan states: 8

> "Based on the limited amount of topsoil available for reclamation, it is Cortez's (*sic*) and BLM's intent to concentrate the re-topsoiling efforts on

> areas where past experience has shown the most promise for successful reclamation."[9]

The National Wildlife Federation suggests that in identifying areas for re-topsoiling, consideration should be given not 8 only to those areas where prospects for success are greatest, but also to areas where stable, revegetated topsoil would be most beneficial. Re-topsoiling efforts should concentrated in areas with the greatest susceptibility to erosion, surface instability, or other potential disturbances.

9. Waste Rock Dump

The plan states that the ". . . top surfaces of the waste rock dumps would be uniformly covered with the **available** topsoil and revegetated."[10] [emphasis added]. National Wildlife suggests that the plan should specifically state that the "top surfaces **will** be covered with topsoil and revegetated."

9

In other words, the use of the word "available" suggests that if topsoil is no longer available at the project site, then Cortez would not be further responsible for topsoil coverage and revegetation of the waste rock dump.

National Wildlife believes that Cortez should be responsible for complete surface topsoil coverage, revegetation, and restoration, regardless of the source of the topsoil.

10. Pit Backfilling

Section 4.15, Irreversible and Irretrievable Commitment of Resources,[11] states that expanded mine pits would not be backfilled or reclaimed. The National Wildlife Federation believes that backfilling abandoned or depleted mine pits 10 could be a viable solution to waste rock and tailings disposal needs that would minimize post mining disturbance of visual and surface resources.

National Wildlife suggests that the following strategies be considered:

---

[9] Cortez Expansion Draft EIS, p. 2-35.

[10] Cortez Expansion Draft EIS, p. 2-30.

[11] Cortez Expansion Draft EIS, pp. 4-44 to 4-45.

a. If depleted, non-producing pits exist at the Gold Acres, Cortez, or Horse Canyon sites, they should be backfilled using waste rock from the proposed expansion project or from other, ongoing activities.

b. Alternately, there are at least ten (10) other mines in the immediate vicinity of the Cortez Expansion Project. NWF suggests using waste rock from Cortez and Gold Acres to backfill other depleted and abandoned pits in the Gold Acres/Cortez area.

10

c. Finally, there may be other abandoned mine pits in the vicinity of the Cortez Project that are not identified in the plan. NWF suggests that an inventory be taken of abandoned mines in need of reclamation and that they be identified and used, where appropriate, as potential waste rock and tailings dumps.

To analyze the viability of these proposals, NWF suggests that a Cost-Benefit Analysis of these three alternatives be undertaken. The results of the analysis would inform the Bureau in recommending other pit backfill alternatives related to this and other projects.

Thank you for your time and consideration.

Dave Alberswerth
Director
Public Lands & Energy Division

Phil Pittman
Conservation Intern
Public Lands & Energy Division

\attachments

TABLE 2.2-3

RECOMMENDED REVEGETATION SEED MIXTURE

Species	Common Name	PLS lbs/acre
Agropyron trichophorum	pubescent wheatgrass	1
Agropyron cristatum	ephraim crested wheatgrass	2
Elymus cinereus	basin wildrye	2
Sitanion hystrix	bottlebrush squirreltail	1
Oryzopsis hymenoides	indian ricegrass	1
Atriplex canescens	fourwing saltbush	2
Medicago sativa	Ladak alfalfa	2
Purshia tridentata	bitterbrush	1
Onobrychis viciaefolia	sainfoin	2
	Total	14

TABLE 3.5-5

VEGETATION COMMUNITIES BY SPECIES, CORTEZ
(Page 1 of 2)

Greasewood Community

Greasewood	*Sarcobatus vermiculatus*
Alkali Blite	

Shadscale/Bud Sagebrush Community

Shadscale	*Atriplex confertifolia*
Bud Sagebrush	*Artemisia spinescens*
Squirreltail	*Sitanion hystrix*
Sandberg Bluegrass	*Poa secunda*
Cheatgrass	*Bromus tectorum*

Sagebrush/Grass Community

Big Sagebrush	*Artemisia tridentata*
Black Sagebrush	*Artemisia nova*
Low Sagebrush	*Artemisia arbuscula*
Pygmy Sagebrush	
Rabbitbrush	*Chrysothamnus* spp.
Spiny Hopsage	*Gravia spinosa*
Horsebrush	*Tetradymia* sp.
Balsamroot	*Balsamorhiza* sp.
Buckwheat	*Eriogonum* sp.
Squirreltail	*Sitanion hystrix*
Thurber Needlegrass	*Stipa thurberiana*
Sandberg Bluegrass	*Poa secunda*
Basin Wildrye	*Elymus cinereus*
Cheatgrass	*Bromus tectorum*

TABLE 3.5-5

VEGETATION COMMUNITIES BY SPECIES, CORTEZ
(Page 2 of 2)

Juniper Community	
Utah Juniper	*Juniperus utahensis*
Black Sagebrush	*Artemisia nova*
Snowberry	*Symphoricarpos* sp.
Sandberg Bluegrass	*Poa secunda*

TABLE 3.5-6

VEGETATION COMMUNITIES BY SPECIES, GOLD ACRES

Sagebrush/ Grass Community	
Black Sagebrush	Artemisia nova
Wyoming Big Sagebrush	Artemisia tridentata wyomingensis
Low Sagebrush	Artemisia arbuscula
Shadscale	Atriplex confertifolia
Spiny Hopsage	Grayia spinosa
Rabbitbrush	Chrysothamnus spp.
Halogeton	Halogeton glomeratus
Squirreltail	Sitanion hystrix
Sandberg Bluegrass	Poa secunda
Thurber Needlegrass	Stipa thurberiana
Cheatgrass	Bromus tectorum
Shadscale/Bud Sagebrush Community	
Shadscale	Atriplex confertifolia
Bud Sagebrush	Artemisia spinescens
Sandberg Bluegrass	Poa secunda
Squirreltail	Sitanion hystrix
Cheatgrass	Bromus tectorum

RESPONSE TO COMMENT III-1

As noted in response to Comment II-16, the $1,425,624 revised figure is the bond estimate calculation required under current BLM and Nevada regulations. This estimate is for the proposed 428-acre expansion, not the entire facility.

Cortez has filed a detailed reclamation plan for the remainder of the facility. As per the agreement between the State of Nevada and the Nevada BLM, a bond must (based on the calculations in the overall reclamation plan) be in place by October 1, 1993. The Bureau is currently reviewing the reclamation plan for the remainder of the Cortez facility, as well as the submitted bond calculations.

The recommendation of ". . . utilizing worse-case assumptions and scenarios . . ." is noted. Current bonding regulations, policies, and Nevada statutes make no such provisions for the use of such scenarios.

RESPONSE TO COMMENT III-2

Comment is noted. Current Bureau bonding policies and regulations, as well as Nevada statutes, make no provisions for such a scenario.

Refer to the draft "Revegetation Standards for Nevada's Surface Management Program" identified in the Environmental Protection Agency's responses (Comment I-23) for further clarification of draft bond release criteria for revegetation success.

RESPONSE TO COMMENT III-3

The statement in the summary of the DEIS is accurate. The lack of critical habitats within the project disturbance area precludes direct impacts from mine expansion. Indirect impacts are also considered insignificant.

The Bureau, when it decides an EIS is warranted, is *required* by regulation to contact the USDI Fish and Wildlife Service (USFWS). A project description and map of the project location is sent to the local USFWS Field Office. The USFWS then sends back all known information related to Threatened and Endangered (T&E) species that may inhabit the project area. USFWS also sends a list of Candidate II species for the Bureau's additional consideration.

This information, combined with field studies of Bureau and contractor staffs, was used to determine what, if any, impacts may result to T&E or Candidate II species as a result of the proposed Cortez Gold Mines Expansion project.

a) - There are no dense stands of sagebrush or rabbitbrush on any of the acreage proposed for disturbance. Although pygmy rabbits may occur in the cumulative study area (primarily Horse Canyon area), they would not be directly impacted by the mine expansion. The DEIS is amended to state that pygmy rabbit habitat could be affected by reasonably foreseeable development in the Horse Canyon area but would not be affected by the Proposed Action.

Similarly no critical habitat for loggerhead shrikes would be disturbed. Although birds are common in the cumulative study area and utilize a wide variety of habitats, areas that would be disturbed by the Proposed Action do not contain critical habitat.

b) - There would be no direct or indirect disturbance to habitats in Indian Creek by the Proposed Action; thus, impacts to fisheries in Indian Creek are unlikely.

c) - Golden eagles are present within the cumulative study area but no impacts to known eyries or territories were indicated during the impact analysis of the Proposed Action. None of the areas disturbed by the Proposed Action have cliffs or knolls that would be favored by the eagles. Eagles have used abandoned open pits for perching and possibly nesting but the inactive pits in the areas of mine expansion are adjacent to active operations and not attractive to eagles or other sensitive raptors.

RESPONSE TO COMMENT III-4

At the present time, BLM standards for revegetation are in draft form and there may be some adjustment when final standards are set (also refer to response to Comment I-23). The objective of the seed mixture specified by the BLM is overall revegetation success. There is a distinction between the long-term post-mining land use and the short-term reclamation goals. One of the primary short-term goals of the reclamation is the stabilization of the replaced topsoil/growth medium by fast-growing perennials. This prevents soil loss from the effects of wind and water erosion. Once stabilized, the reclaimed surfaces provide good sites for the reintroduction of the surrounding plant communities. In the long term, the re-establishment of these plant communities by natural succession should meet the post-mining land use goals.

RESPONSE TO COMMENT III-5

A 50-ppm WAD cyanide level is identified by NDOW as an observational threshold of lethal levels for waterfowl in Nevada. NDOW, which issues permits for industrial ponds (including cyanide systems) in Nevada, allows tailings ponds to remain uncovered if cyanide concentrations are held below lethal levels. Lethal levels are further defined as levels below which no mortality to wildlife occurs. The industrial pond permit also states that systems must be in place on open ponds to reduce cyanide concentrations should wildlife mortality become evident. Another permit requirement is that wildlife mortality must be reported within 24 hours to NDOW. Tailings Ponds 6 and 7 would be operated below threshold levels, so barriers would not be required.

As stated on page 4-25 of the DEIS, heap surfaces would either be scarified or a drip system used to prevent pooling of leach surfaces. Thus no barriers or netting would be required to prevent wildlife access.

RESPONSE TO COMMENT III-6

In accordance with NDEP Permit No. NEV00023 (Appendix D), the entire facility (e.g., tailings ponds and solution collection ponds) would be designed to withstand, without damage, the flood waters arising from a storm of 24-hour, 100-year-interval occurrence.

Potential impacts to surface water drainages including sedimentation, contaminant transport and deposition, and acid rock drainage are discussed in Section 4.4.2 of the DEIS. Mitigation measures for these potential impacts are discussed in Section 4.4.3.

RESPONSE TO COMMENT III-7

As discussed on page 4-19 of the DEIS, a network of water pollution control wells has been installed to remediate the existing WAD cyanide plume. The pumpback water from these wells is used as quench water for the Cortez Roaster Facility, thereby replacing freshwater makeup and reducing total water consumption.

Groundwater drawdown will naturally occur in the immediate vicinity of the remediation (water pollution control) wells. Drawdown will also occur in the vicinity of the water supply well. The removal of cyanide-contaminated groundwater in the immediate vicinity of the ponds prevents the mixing of this water with higher-quality groundwater downgradient of the ponds. In this manner, the downgradient groundwater quality is protected.

Any potential impacts associated with this groundwater drawdown are expected to be localized and minimal. No other groundwater users are affected nor are any wetlands impacted since none exist in the area affected by drawdown (see Section 4.4.2 of the DEIS). The nearest water right in the vicinity of the Cortez Mine (owned by Wintle) is located about 6.0 miles to the north. Groundwater drawdown resulting from the water pollution control wells is not expected to extend more than 1 mile north of the facility.

No ore pits will accumulate subsurface drainage because of the depth to water near the proposed expansion area.

RESPONSE TO COMMENT III-8

Identification of areas that would be topsoiled and revegetated would be based on BLM standards for revegetation (see responses to Comments I-23 and III-4) and test-plot results from existing steep slopes. Susceptibility to erosion, surface instability, or other potential disturbances will all be considered. According to BLM and Nevada reclamation regulations, all disturbed areas must be stabilized by revegetation or other reclamation techniques.

RESPONSE TO COMMENT III-9

The top surfaces of the regraded waste dumps are the most likely sites for revegetation success. They are also areas where stable revegetated topsoil would be beneficial. They are therefore primary targets for topsoiling and revegetation. The last paragraph in Section 2.2.7.10 explains the methods used to redistribute the topsoil materials and prepare a good seedbed.

Section 2.2.7.1 also explains the methods for topsoil salvage and storage until the material is needed for reclamation.

RESPONSE TO COMMENT III-10

Refer to page 2-42, Chapter 2.4.2.3, "Sequential Filling of Existing Open Pits with Waste Rock," of the Draft EIS.

As noted in this discussion, this "sub-alternative" (a variation of placement of facility location, not a true "alternative" in the normal NEPA context) was considered from an engineering and economic standpoint by Cortez, as well as an environmental standpoint by the Bureau.

It is important for each reviewer to note here that the Bureau's "Surface Management Regulations," 43 CFR 3809, require the Bureau to "Coordinate, to the greatest extent possible, with appropriate state agencies, ..." [43 CFR 3809.0-2 (c)] Current state of Nevada regulation specifically states that a company must consider the backfilling of pits when preparing a Plan of Operations. Overriding considerations, including the economics of additional hauling or preserving known mineralization, are considered sufficient reasoning under Nevada regulation to not consider the backfilling of a pit.

In addition, one must consider two other factors when reviewing the option of backfilling a pit: (1) Cortez is dealing with microscopic, disseminated gold deposits. What is not economical to mine at 1993 prices may prove highly economical in a few years, if that low-grade ore remains exposed from past mining activities. If a mine covers that low-grade resource (i.e., backfills the pit), that resource may not be economical to mine in the future.

And, (2) that same low-grade ore dictates profits for a company. The more steps, in this case additional hauling costs to backfill other pits, as suggested by the National Wildlife Federation in Comment III-10, "b" and "c," means additional costs. This in turns makes this low-grade ore even less profitable to mine.

The cost-benefit analysis requested in the last paragraph of the NWF letter must be placed in the context of Comment III-10, part "a." The focus here is "depleted, non-producing pits". All the pits that have any backfilling potential on the Cortez site have potential ore reserves at some future date. In addition to identifying these reserves, 43 CFR 3809.0-5 (j) gives Cortez the right to ". . . preserve evidence of mineralization."

8/2

WILDERNESS IMPACT RESEARCH FOUNDATION
491 4TH STREET
ELKO, NEVADA 89801

A. GRANT GERBER
Chairman

PHONE: (702) 738-2009
FAX: (702) 738-8198

Way 2/26/93

February 18, 1993

Mr. Dave Davis, Cortez Coordinator ✓
Battle Mountain District
Bureau of Land Management
P.O. Box 1420
Battle Mountain, NV 89820

Re: __**Cortez Gold Mine Expansion**__

Dear Mr. Davis:

We support the expansion of the Cortez Gold Mine.

We have reviewed the environmental issues in the area and have concluded that the plan by Cortez properly and adequately answers all relevant concerns for wildlife and the habitat.

We are also pleased that this expansion by Cortez will result in many additional high paying jobs for Nevada.

Very truly yours,

A. Grant Gerber

A. GRANT GERBER mt
Chairman

AGG/mt

United States Department of the Interior

TAKE PRIDE IN AMERICA

BUREAU OF MINES

WESTERN FIELD OPERATIONS CENTER
EAST 360 3RD AVENUE
SPOKANE, WASHINGTON 99202-1413

MAR -1 AM 11: 11

February 23, 1993

Memorandum

To: Cortez Coordinator, Bureau of Land Management, Battle Mountain, Nevada

From: Chief, Branch of Engineering and Economic Analysis

Subject: Cortez Gold Mine Expansion Project, Lander County, Nevada

The Bureau of Mines strongly concurs with the proposed alternative. We feel that it allows continuation of the current operation, and its positive economic impact to the local community, with minimal environmental impact.

John R. Norberg

John R. Norberg

In addition to the five letters submitted by the public and Federal Agencies, Dr. Glen Miller, representing the Sierra Club, attended one of the two public meetings held by the Bureau to solicit input on the Cortez Gold Mines Expansion Draft EIS. This meeting occurred on January 20, 1993 at the Airport Plaza Inn, 1981 Terminal Way, Reno, Nevada at 7:00 p.m.

The Bureau videotaped this meeting, as well as the public meeting held on January 19, 1993 at the Elko District Office of the Bureau of Land Management, 3900 East Idaho Street, Elko, Nevada. There were no public comments submitted at the Elko meeting. These tapes are public records and are available for viewing at the Battle Mountain District BLM Office, 50 Bastion Way, Battle Mountain, Nevada, 89820.

First, Dr. Miller posed a series of questions related to the existing Cortez facilities. In addition Dr. Miller made comments on the Cortez Gold Mines Expansion Draft EIS. These questions and comments are summarized below. Each question or comment is followed by either a summary of the answer to questions posed by Dr. Miller, or the Bureau's response to his comments. It is important to note that Dr. Miller's comments and questions have been summarized by the Bureau. These summaries represent, to the best of the Bureau's abilities, all the content, premises, and subjects Dr. Miller presented during the meeting.

DR. MILLER'S QUESTIONS ABOUT THE EXISTING CORTEZ FACILITIES AND RESPONSES

1) How long does Cortez and/or the NDEP envision to remediate the known groundwater contamination at Cortez (page 3-23 of the Draft EIS)?

Response from Mark List, Environmental Engineer, Cortez Gold Mines:

The monitoring and remediation program at the Cortez facilities is an ongoing, continuously refined program. Cortez and the Nevada Division of Environmental Protection (NDEP) believe that the current pump-out remediation program is the most realistic and best solution to control the contamination situation. Cortez's best estimates are that the pump-out remediation program time frame will be on the order of 5 to 10 years.

2) What is the source of the contamination? Is it the tailings impoundment or a heap leach?

Mark List responded:

The tailings facility is the most likely source. There is also a strong indication for some off-site source to be contributing to the problem.

3) Is cyanide the problem (contaminant)? Are there metals?

Mark List responded:

The situation is continually being assessed. Originally, cyanide was the main indicator parameter being analyzed for in the analytical program. In renewing Cortez's 1991 operating permit, NDEP and Cortez agreed to an accelerated and expanded investigation. The monitoring program is now looking at the entire Profile I analytical sweep (see page 14 of the Cortez Water Pollution Control Permit in Appendix D for the content of this Profile I) to identify individual parameters that may exceed Nevada standards.

4) Historical or naturally occurring heavy metal or salinity contamination that existed prior to mining has proven to be a problem with other mines, such as in the case of Galactic's Summitville Mine. Delineating between these naturally occurring contaminants and contamination that Cortez may be responsible for is a problem. Has Cortez found any indication of upgradient contamination? Are there any indications of naturally occurring mercury, cyanide, etc.?

Mark List responded:

Mr. List asked for clarification of the question, "Is there any evidence of a pre-existing condition versus a natural condition?"

Dr. Miller clarified: The Summitville Mine referenced earlier was known to have a pre-existing contamination from the same orebody that was eventually mined. In other words, the contamination had always been there. Is there any indication that Cortez is facing a similar situation? Are there metal contaminants or salts/chlorides from a pre-existing condition?

Mr. List responded:

There are three factors influencing the groundwater quality at the Cortez site: (1) natural geochemical influences, (2) historic sources located off site acting on the system, and (3) a component attributable to early current operations.

Cortez is continuing to upscale its monitoring program. The final goals or standards of the remediation program have not been established by the NDEP.

5) Is the BLM involved in the discussions related to setting the parameters for this remediation effort? What are the parameters being looked at? Total cyanide? Mercury? WAD cyanide? Dr. Miller noted that the final established parameters will ultimately determine the costs of this remediation effort. The costs associated with meeting various standards dramatically affects the costs of such programs. Dr. Miller pointed out that the costs associated with meeting background-level standards would likely cost considerably less than drinking water standards; drinking water standards would likely be considerably less than meeting wildlife/aquatic habitat standards, etc. Dr. Miller thought it was appropriate that the Final EIS delineate the proposed remediation standards.

Tom Leshendok, Deputy State Director for Minerals, Nevada State Office BLM responded:

The parameters of this remediation effort are the same parameters that are established or will be established by the Nevada Division of Environmental Protection. The Bureau does not have any separate standards that are different than those required by the NDEP.

The BLM and Cortez have asked for these standards to be established for the Final EIS.

The NDEP has responded in a letter to the BLM and Cortez dated March 25, 1993. Here is NDEP's response to Dr. Miller's concern on what level of remediation Cortez will be held accountable to:

> Applicable ground water standards for Cortez are related to NAC 445.24342 which states that no facility may degrade ground water to the extent that the quality is lowered below a state or federal regulation prescribing a standard for drinking water. Applicable ground water standards are the primary and secondary standards (Profile I). Also included in NAC 445.24342 is the standard for WAD cyanide of 0.2 mg/l.
>
> There are no numeric standards for surface waters at the Cortez site. NAC 445.119, which states narrative standards applicable to all waters in the State, would apply.
>
> The basis for remediation standards is again found in NAC 445.24342 which defines degradation. Impacted ground water which originally met all standards must be remediated to the point where all standards are met again. If the impacted ground water had specific elements which exceeded standards prior to the current release, remediation standards would be either to the pre-release background level or to a higher level that would not render the water unsuitable for existing or potential municipal, industrial, domestic, or agricultural use.

6) Again, Dr. Miller referenced the Galactic Summitville Mine in Colorado. Dr. Miller expressed a strong concern about salinity, stating that the current tailings impoundment at Cortez contains thousands of tons of salts. Dr. Miller stated that some of the levels could exceed the 800 to 1,000 grams/liter level. He was concerned about long-term remediation efforts, again asked what level Cortez's remediation effort would be held to, and wanted to know what bond the Bureau would set to ensure that remediation effort would be successful.

Mark List of Cortez, responded with some additional information on the contamination problem/remediation effort:

There is another dimension other than the hydro-geochemistry that must be included when discussing the Cortez groundwater issue. That is the hydraulics of the local aquifer system. As is understood at this time, the groundwater contamination at Cortez is contained in a shallow, discontinuous, localized zone. The affected system appears isolated from deeper sequences of the alluvial aquifer in Crescent Valley that might be accessed for domestic drinking water purposes.

Bureau response to #6: Please refer to the NDEP's response in Comment No. 5 for the levels Cortez's remediation effort will be held to.

Under current regulatory and policy guidelines, as well as State of Nevada regulations and laws, there is no provision made for bonding of remediation efforts. Current bonding policies provide only for surface reclamation and neutralizing of cyanide facilities located on public lands.

7) Dr. Miller had one final comment/question prior to submitting his formal comments on the Draft EIS.

Dr. Miller indicated that he believed that upwards of 50 percent of all gold mines in Nevada had contamination problems similar to Cortez. He indicated that one occurrence of contamination in the remote area of Crescent Valley is not a significant problem in his estimation. But when one adds the contamination at Battle Mountain Gold, Newmont, Boulder Valley, etc., then you have a regional or "global" issue. He wanted to know how many more mines the BLM was going to permit to contaminate the groundwater systems on public lands in Nevada. He also felt that the Bureau should address this issue as a cumulative impact in some document, such as the Cortez EIS. Dr. Miller also indicated that the Bureau should set a point where no more mining would be permitted until the current contamination problems would be cleaned up, even if it meant that a mining company would spend all of its profits in such a cleanup.

Bureau's Response to #7: First, Cortez's groundwater contamination circumstances are known to be highly localized, occurring in a small alluvial aquifer that is hydraulically isolated from any other hydrologic feature. It is the only contamination known to be occurring in this hydrographic basin. Therefore, under the Bureau's current definition of cumulative impacts, there are no cumulative impacts occurring as a result of this contamination to that hydrographic basin.

Secondly, the purpose of disclosing this groundwater contamination in the Draft EIS was threefold: (1) to inform the public that there is an ongoing groundwater contamination problem associated with the Cortez facility, (2) to identify the location of and the extent of the problem, and (3) to inform the public what Cortez and the State of Nevada and the BLM are doing to rectify the problem.

In reviewing the information, it is important to note that the contamination source is suspected to be coming from (1) natural geochemical sources, (2) potential historic sources, and (3) a 25-year-old tailings facility. The Proposed Action, including the new cyanide facilities, all meet the latest design requirements, including the use of clay and polymer liners. Based on these designs, there are no anticipated additional direct or indirect impacts (and thus no cumulative impacts) to this groundwater contamination situation from Cortez's proposed 428-acre expansion.

The Bureau's and the State of Nevada's current bonding procedures cover earthwork and revegetation reclamation. Currently, there are no regulations or policies in place that permit bonding to ensure that groundwater remediation efforts are successful.

Water issues, both surface and groundwater, are State of Nevada regulated. Nevada has been given "primacy" by the Environmental Protection Agency for regulating all federal laws associated with waters in the state.

The Bureau has not *permitted* any mine to contaminate any waters in Nevada. 43 CFR 3809 specifically mandates in all Plans of Operations approvals that all applicable federal, state, and local laws and regulations must be complied with.

In all instances where groundwater contamination has been identified, the proponent, the NDEP, and the Bureau are working closely together to remediate these problems.

DR. MILLER'S COMMENTS ON THE DRAFT EIS

1) Dr. Miller briefly reiterated his concerns about the groundwater contamination. He then moved on to state that his understanding of the Council of Environmental Quality regulations required that there be mitigation measures taken to restore the land to its pre-mining land use. He felt that the statement in the Draft EIS, page 2-36, which states "Revegetation would be considered a success based on establishment of seedlings in accordance with BLM and NDEP

revegetation success criteria to be established by summer (sic) of 1993" (emphasis added), was improper in light of his understanding of the CEQ regulations. He stated that these criteria were established in draft and that they should be stated in the EIS.

Bureau response: See response to Comment I-23 of the EPA letter.

2) Dr. Miller objected to the content of statement located in Section 2.2.7.13, "Reclamation Surety," on page 2-37 which states: "The surety to be posted by Cortez would be in a form acceptable to NDEP and BLM and will be held by the BLM."

Dr. Miller felt that the Nevada statutes defined these parameters adequately, and that these parameters should be restated in the EIS. Dr. Miller noted that the "general public" do not know these requirements.

Bureau response: As noted in a number of earlier comments, the Council of Environmental Quality Regulations specifically mandate that all NEPA documents be limited in length (size). These regulations provide specific directions as to methods to accomplish these goals.

One of these methods is to limit the reprinting of rules, laws, regulations, etc., that are "readily available" to the public. The Bureau feels that since the referenced Nevada regulations were promulgated in a public forum, and may easily be obtained by contacting the NDEP, they meet the "readily available" criteria established by the CEQ.

Therefore, these regulations will not be reprinted in the Final EIS as Dr. Miller requested.

3) Dr. Miller indicated that the Pipeline Project was "known" by both Cortez and the BLM well over a year prior to printing of the Draft EIS. He wanted to know why it was not included in the reasonably foreseeable future development. Specifically, Dr. Miller wanted to know why there was no map of the Pipeline Project location in the Draft EIS.

Bureau response: This was addressed at the meeting by the Bureau's Cortez Team Leader and is reiterated here for the record.

The Pipeline Project is located in the Cortez Gold Mines Expansion Draft EIS, in the cumulative impacts section (Section 5.0). Specifically, Section 5.2.2, "Reasonably Foreseeable Future Development Scenarios for Mining," page 5-7, identifies what the Bureau and Cortez knew of the Pipeline development at the time of printing the Draft EIS. The detail provided in this section was the best information available at the time.

The exact delineation of the deposit, location of facilities, etc., had not been determined at the time the Draft EIS was printed.

Dr. Miller conceded that a text description of the Pipeline Project was adequate, considering the level of detail that was known at the time.

4) Dr. Miller wanted immediate removal of cattle that would be displaced by the proposed expansion. He also wanted Cortez to reimburse the ranchers affected for any loss of AUMs (Animal Unit Months).

Bureau's response: The Bureau's Team Leader responded to this concern at the meeting. This response is reiterated here for the record.

First, under the Public Range Improvement Act (PRIA) regulations, the Bureau is required to give a permittee a two (2) year suspension notice of loss of AUMs resulting from a mining operation. There is no opportunity provided for in those regulations for the Bureau to "immediately" suspend the AUMs.

Second, it is the policy of the Shoshone-Eureka Resource Area to issue those 2-year suspensions when warranted. This has occurred in the allotments where the Echo Bay Mine, the Battle Mountain Gold Mine, and the Atlas Gold Bar II Mine are located. This will also occur at the Cortez mine.

Finally, it is against regulations for Cortez to buy or reimburse a permittee for AUMs lost to mining on Public Lands — i.e., Cortez may not legally reimburse the permittee for any loss of AUMs that the Bureau is going to remove from that permittee's grazing license.

5) Dr. Miller indicated at the January 20th meeting that he would submit these comments and concerns in writing to the Bureau.

Bureau response: The Bureau contacted Dr. Miller at the close of the comment period when his written comments had not arrived at the Battle Mountain Office.

Dr. Miller indicated that he had decided not to submit his comments in writing; that his verbal comments at the January 20th meeting would suffice.

If Dr. Miller indicated in the January 20th request that he [illegible] comments in writing to the Board.

design or construct. The Board considered [illegible] his written comments [illegible]

Dr. Miller indicated that he had decided not to [illegible] verbal comments at the January 20th [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

APPENDIX A
METEORIC WATER MOBILITY/ACID BASE ACCOUNTING FOR CORTEZ AND GOLD ACRES WASTE ROCK AND TAILINGS AND WATER QUALITY INFORMATION FOR CORTEZ PIT

Appendix A1	Meteoric Water Mobility and Acid-generating Potential for Waste Rock and Tailings Impoundment Number 6, Third Quarter 1991 through First Quarter 1993
Appendix A2	Cortez Pit Water Quality

Appendix A1

Meteoric Water Mobility and Acid-generating Potential for Waste Rock and Tailings Impoundment Number 6, Third Quarter 1991 through First Quarter 1993

Meteoric Water Mobility Procedure

Sample Location   Cortez Waste

	3rd Qu. 1991	4th Qu. 1991
Sampling Date	8-29-91	12-6-91
Alkalinity, Total	94	39.4
Aluminum	5.37	25.8
Antimony	<.05	<.05
Arsenic	.38	.032
Barium	.177	.486
Beryllium	<.001	<.001
Bismuth	.0688	.4047
Cadmium	.014	<.007
Calcium	7.13	126
Chloride	13.6	4.96
Chromium	.083	.09
Cobalt	<.007	.027
Copper	.017	.093
Fluoride	.697	.133
Gallium	.0832	.914
Iron	9.08	29.3
Lead	.05	.069
Lithium	.009	.077
Magnesium	3.88	30.9
Manganese	.225	1
Mercury	<.0005	.00788
Molybdenum	<.015	.015
Nickel	.063	.016
Nitrate	<1	2.63
pH, initial	8.8	5.2
pH, final	8.6	8.8
Phosphorus	.041	.023
Potassium	2.99	13.2
Scandium	<.01	.0216
Selenium	.006	<.005
Silver	<.02	<.02
Sodium	51.5	14.5
Strontium	.045	.397
Sulfate	26.2	9.4
Thallium	<.15	<.15
Tin	<1.3	<1.3
Titanium	.085	.817
Total Dissolved Solids	310	431
Vanadium	.128	.929
Zinc	.103	.201

Max. Potential Acidity, Ton/1000 Ton	.938
Gross Neutral. Potential, Ton/1000 Ton	304
Paste pH	9.4

Note: This format is designed to provide a cumulative record of data from four consecutive sampling periods.

Meteoric Water Mobility Procedure

Sample Location Cortez Waste

	1st Qu. 1992	2nd Qu. 1992	3rd Qu. 1992	4th Qu. 1992
Sampiing Date	3-5-92	6-3-92	8-31-92	11-19-92
Alkalinity, Total	86.6	57.1	78.1	55
Aluminum	0.503	<.05	0.208	0.169
Antimony	<.05	<.05	<.05	<0.05
Arsenic	0.127	0.106	0.112	0.049
Barium	0.147	0.079	0.138	0.063
Beryllium	<.001	<.001	<.001	<0.001
Bismuth	0.0927	<.035	<.035	<.035
Cadmium	<.007	<.007	<.005	<0.01
Calcium	2.6	10.6	13.2	73.3
Chloride	18	16.9	39.7	n/a
Chromium	<.01	<.01	<.01	<0.01
Cobalt	<.007	<.007	<.005	<0.005
Copper	<.007	<.007	<.005	0.006
Fluoride	0.901	0.78	0.686	0.657
Gallium	0.1894	<.1	<.1	<0.1
Iron	0.469	<.05	0.073	0.11
Lead	<.05	0.032	<.005	<0.005
Lithium	<.005	0.015	0.013	0.012
Magnesium	0.836	2.74	2.7	3.7
Manganese	0.005	<.003	<.005	0.017
Mercury	0.00053	0.000531	<.0005	<0.0005
Molybdenum	0.015	0.012	0.012	<0.01
Nickel	<.015	<.015	<.02	<0.01
Nitrate	1.5	4.2	1.2	10.6
pH, initial	5	5.7	6	5.96
pH, final	8.8	8.2	7.9	8.76
Phosphorus	0.053	0.03	0.018	<0.01
Potassium	<1.5	4.36	3.8	3.44
Scandium	<.01	<.01	<.01	<0.01
Selenium	<.13	<.005	<.005	<0.005
Silver	<.02	<.01	<.01	<0.01
Sodium	53	70.2	79.3	72.9
Strontium	0.035	0.165	0.112	0.104
Sulfate	26.6	109	90	92.5
Thallium	<.15	<.1	<.005	<0.005
Tin	<1.3	0.126	<.1	<0.1
Titanium	0.007	<.005	<.005	<0.005
Total Dissolved Solids	168	101	300	310
Vanadium	0.015	0.035	<.007	0.013
Zinc	0.015	<.005	0.01	0.035
Max. Potential Acidity, Ton/1000 Ton	10.3	1.25	2.5	5
Gross Neutral. Potential, Ton/1000 Ton	369	493	366	322
Paste pH	9.47	8.27	9.48	8.5

Note: This format is designed to provide a cumulative record of data from four consecutive sampling periods.

Meteoric Water Mobility Procedure

Sample Location Gold Acres Waste

	3rd Qu. 1991	4th Qu. 1991
Sampling Date	8-29-91	12-6-91
Alkalinity, Total	36	68.2
Aluminum	.329	.194
Antimony	<.05	<.05
Arsenic	.024	.145
Barium	.095	.015
Beryllium	<.001	<.001
Bismuth	.043	.429
Cadmium	<.007	<.007
Calcium	22.4	14.5
Chloride	29.5	25.2
Chromium	.101	<.01
Cobalt	<.007	<.007
Copper	.008	<.007
Fluoride	.353	2.81
Gallium	.0888	.9504
Iron	.393	<.008
Lead	<.05	<.05
Lithium	<.005	.017
Magnesium	3.69	8.49
Manganese	.01	.048
Mercury	<.0005	.00385
Molybdenum	<.015	.103
Nickel	.036	<.015
Nitrate	6.77	3.72
pH, initial	8.8	5.8
pH, final	9.3	8.4
Phosphorus	.321	.085
Potassium	4	2.54
Scandium	<.01	.0223
Selenium	.049	.009
Silver	<.02	<.02
Sodium	35.6	53.2
Strontium	.109	.096
Sulfate	61.3	67.9
Thallium	<.15	<.15
Tin	<1.3	<1.3
Titanium	.019	.004
Total Dissolved Solids	200	198
Vanadium	.008	<.007
Zinc	.022	.017
Max. Potential Acidity, Ton/1000 Ton	2.19	1.3
Gross Neutral. Potential, Ton/1000 Ton	23.9	236
Paste pH	7.3	8.34

Note: This format is designed to provide a cumulative record of data from four consecutive sampling periods.

Meteoric Water Mobility Procedure

Sample Location Gold Acres Waste

	1st Qu. 1992	2nd Qu. 1992	3rd Qu. 1992	4th Qu. 1992
Sampling Date	3-5-92	6-3-92	8-31-92	11-18-92
Alkalinity, Total	63	36.4	43.1	63.8
Aluminum	0.461	<.05	<.05	<0.05
Antimony	<.05	<.05	<.05	<0.05
Arsenic	0.028	<.01	0.011	<0.005
Barium	0.026	0.002	0.178	0.007
Beryllium	<.001	<.001	<.001	<0.001
Bismuth	0.1612	<.035	<.035	<0.035
Cadmium	<.007	<.007	0.007	<001
Calcium	46.4	317	313	542
Chloride	6.76	21.6	5.18	n/a
Chromium	<.01	<.01	0.016	0.046
Cobalt	<.007	0.009	<.005	0.007
Copper	0.011	<.007	<.005	<0.005
Fluoride	1.08	1.07	2.2	0.445
Gallium	0.2676	<.1	<.1	<0.1
Iron	<.008	<.05	<.05	0.082
Lead	<.05	0.03	<.005	0.005
Lithium	0.007	0.025	0.006	0.008
Magnesium	11.2	67.8	24.4	91.3
Manganese	<.003	0.854	0.239	1.56
Mercury	0.00033	<.0005	<.0005	<0.0005
Molybdenum	0.016	0.021	0.053	0.019
Nickel	<.015	0.155	<.02	0.019
Nitrate	18.1	4.7	1.71	2.44
pH, initial	5.9	5.5	5.9	5.96
pH, final	7.8	7.7	7.6	7.63
Phosphorus	0.101	0.05	<.01	<0.01
Potassium	2.75	3.86	9.2	5.49
Scandium	<.01	<.01	<.01	<0.01
Selenium	<.13	0.083	0.019	0.084
Silver	<.02	<.01	0.012	<0.01
Sodium	28.7	69.6	19.6	14.3
Strontium	0.097	<.001	0.197	0.344
Sulfate	105	1050	506	1490
Thallium	<.15	<.1	<.005	<0.005
Tin	<1.3	<.1	<.1	<0.1
Titanium	<.001	<.005	<.005	<0.005
Total Dissolved Solids	328	1770	798	2510
Vanadium	<.007	<.007	<.007	<0.007
Zinc	0.024	0.325	0.232	0.162
Max. Potential Acidity, Ton/1000 Ton	7.81	85.94	31.9	108
Gross Neutral. Potential, Ton/1000 Ton	76.8	238	97.4	187
Paste pH	7.54	7.21	7.88	7.43

Note: This format is designed to provide a cumulative record of data from four consecutive sampling periods.

Meteoric Water Mobility Procedure

Sample Location Gold Acres Waste

Sampling Date	1992/06/03	1992/08/31	1992/11/18	1993/02/19
Alkalinity, Total	36.4	43.1	63.8	29500
Aluminum	<.05	<.05	<0.05	31.6
Antimony	<.05	<.05	<0.05	0.06
Arsenic	<.01	0.011	<0.005	0.75
Barium	0.002	0.178	0.007	0.434
Beryllium	<.001	<.001	<0.001	0.003
Bismuth	<.035	<.035	<0.035	<0.035
Cadmium	<.007	0.007	<001	0.012
Calcium	317	313	542	204
Chloride	21.6	5.18	n/a	9.4
Chromium	<.01	0.016	0.046	0.08
Cobalt	0.009	<.005	0.007	0.017
Copper	<.007	<.005	<0.005	0.177
Fluoride	1.07	2.2	0.445	2.49
Gallium	<.1	<.1	<0.1	<0.1
Iron	<.05	<.05	0.082	34.4
Lead	0.03	<.005	0.005	0.056
Lithium	0.025	0.006	0.008	0.114
Magnesium	67.8	24.4	91.3	72.5
Manganese	0.854	0.239	1.56	1.29
Mercury	<.0005	<.0005	<0.0005	<0.0005
Molybdenum	0.021	0.053	0.019	0.073
Nickel	0.155	<.02	0.019	0.069
Nitrate	4.7	1.71	2.44	0.4
pH, initial	5.5	5.9	5.96	5.67
pH, final	7.7	7.6	7.63	8.17
Phosphorus	0.05	<.01	<0.01	1.08
Potassium	3.86	9.2	5.49	62.3
Scandium	<.01	<.01	<0.01	<0.01
Selenium	0.083	0.019	0.084	0.017
Silver	<.01	0.012	<0.01	<0.01
Sodium	69.6	19.6	14.3	11.7
Strontium	<.001	0.197	0.344	0.192
Sulfate	1050	506	1490	355
Thallium	<.1	<.005	<0.005	<0.005
Tin	<.1	<.1	<0.1	<0.1
Titanium	<.005	<.005	<0.005	0.475
Total Dissolved Solids	1770	798	2510	650
Vanadium	<.007	<.007	<0.007	0.132
Zinc	0.325	0.232	0.162	3.03
Max. Potential Acidity, Ton/1000 Ton	85.94	31.9	108	51.6
Gross Neutral Potential, Ton/1000 Ton	238	97.4	187	163
Paste pH	7.21	7.88	7.43	8.16

Note: This format is designed to provide a cumulative record of data from four consecutive sampling periods.

Meteoric Water Mobility Procedure

Sample Location Tailings Pond 6 - Solids

	3rd Qu. 1991	4th Qu. 1991
Sampling Date	8-29-91	12-5-91
Alkalinity, Total	97	76.1
Aluminum	.292	2.19
Antimony	<.05	<.05
Arsenic	.09	.165
Barium	.088	.066
Beryllium	<.001	<.001
Bismuth	<.035	.3316
Cadmium	<.007	<.007
Calcium	327	329
Chloride	152	71.7
Chromium	<.01	.016
Cobalt	.087	.032
Copper	.302	.033
Fluoride	2.38	2.5
Gallium	.2787	.8989
Iron	<.008	2.43
Lead	<.05	<.05
Lithium	.034	.038
Magnesium	.346	3.22
Manganese	<.003	.089
Mercury	.01725	<.0005
Molybdenum	.44	.266
Nickel	<.015	<.015
Nitrate	4.03	1.4
pH, initial	8.8	5.5
pH, final	11.9	10.5
Phosphorus	.023	.068
Potassium	70.1	51.6
Scandium	<.01	.0209
Selenium	.051	.04
Silver	.039	<.02
Sodium	234	74.4
Strontium	1.4	.702
Sulfate	975	987
Thallium	<.15	<.15
Tin	<1.3	<1.3
Titanium	<.001	.047
Total Dissolved Solids	1998	1695
Vanadium	.069	.706
WAD Cyanide	10.4	3.38
Zinc	.075	.02
Max. Potential Acidity, Ton/1000 Ton	3.44	29
Gross Neutral. Potential, Ton/1000 Ton	349	171
Paste pH	10.2	9.92

Note: This format is designed to provide a cumulative record of data from four consecutive sampling periods.

Meteoric Water Mobility Procedure

Sample Location Tailings Pond 6 - Solids

	1st Qu. 1992	2nd Qu. 1992	3rd Qu. 1992	4th Qu. 1992
Sampling Date	3-5-92	6-3-92	9-2-92	11-19-92
Alkalinity, Total	91.8	42.3	10.2	15.4
Aluminum	0.314	1.79	0.262	0.188
Antimony	<.05	0.291	<.05	<0.05
Arsenic	0.011	0.199	0.778	0.158
Barium	0.068	0.671	0.028	0.039
Beryllium	<.001	0.459	<.001	<0.001
Bismuth	0.1335	0.458	<.035	<0.035
Cadmium	<.007	0.48	<.005	<0.01
Calcium	345	338	695	73.3
Chloride	86.1	74.5	72.5	n/a
Chromium	<.01	0.461	0.057	<0.01
Cobalt	0.056	0.535	0.042	0.064
Copper	0.099	0.543	0.219	0.064
Fluoride	1.76	1.73	1.23	0.374
Gallium	0.4568	0.985	<.1	0.913
Iron	<.008	0.569	<.05	0.142
Lead	<.05	0.482	<.01	<0.005
Lithium	0.045	0.495	0.026	0.021
Magnesium	0.029	1.51	4.1	4.8
Manganese	<.008	0.458	<.005	0.009
Mercury	0.00065	0.00059	<.0005	<0.0005
Molybdenum	0.523	1.42	0.383	0.112
Nickel	0.006	0.599	<.02	0.086
Nitrate	<.01	1.6	1.67	2.37
pH, initial	5.3	5.9	5.9	5.96
pH, final	10.7	10.2	10	8.42
Phosphorus	0.012	0.02	0.5	<0.01
Potassium	125	106	81.5	30.8
Scandium	<.01	0.915	<.01	<0.01
Selenium	<.13	0.037	0.028	0.019
Silver	<.02	0.491	0.016	<0.01
Sodium	141	121	85.6	77.7
Strontium	1.52	0.758	0.809	0.18
Sulfate	1110	888	1290	336
Thallium	<.15	0.941	0.019	<0.005
Tin	<1.3	0.519	<.1	<0.1
Titanium	<.001	0.486	<.005	<0.005
Total Dissolved Solids	1869	3500	2160	595
Vanadium	0.076	0.525	0.059	<0.007
WAD Cyanide	6.37	N/A	N/A	0.96
Zinc	0.023	0.473	0.007	0.019
Max. Potential Acidity, Ton/1000 Ton	24.4	16.25	39.4	17.2
Gross Neutral. Potential, Ton/1000 Ton	150	157	84.6	322
Paste pH	10.9	10.8	10.1	8.5

Note: This format is designed to provide a cumulative record of data from four consecutive sampling periods.

Meteoric Water Mobility Procedure

Sample Location Tailings Pond 6 - Solids

Sampling Date	1992/06/03	1992/09/02	1992/11/19	1993/02/18
Alkalinity, Total	42.3	10.2	15.4	156
Aluminum	1.79	0.262	0.188	5.27
Antimony	0.291	<.05	<0.05	<0.05
Arsenic	0.199	0.778	0.158	1.67
Barium	0.671	0.028	0.039	0.157
Beryllium	0.459	<.001	<0.001	0.001
Bismuth	0.458	<.035	<0.035	<0.035
Cadmium	0.48	<.005	<0.01	0.009
Calcium	338	695	73.3	555
Chloride	74.5	72.5	n/a	106
Chromium	0.461	0.057	<0.01	0.059
Cobalt	0.535	0.042	0.064	0.067
Copper	0.543	0.219	0.064	1.29
Fluoride	1.73	1.23	0.374	2.58
Gallium	0.985	<.1	0.913	<0.1
Iron	0.569	<.05	0.142	4.87
Lead	0.482	<.01	<0.005	0.019
Lithium	0.495	0.026	0.021	0.033
Magnesium	1.51	4.1	4.8	9.43
Manganese	0.458	<.005	0.009	0.206
Mercury	0.00059	<.0005	<0.0005	0.0013
Molybdenum	1.42	0.383	0.112	0.409
Nickel	0.599	<.02	0.086	0.106
Nitrate	1.6	1.67	2.37	3.64
pH, Initial	5.9	5.9	5.96	5.67
pH, final	10.2	10	8.42	10.2
Phosphorus	0.02	0.5	<0.01	0.556
Potassium	106	81.5	30.8	117
Scandium	0.915	<.01	<0.01	<0.01
Selenium	0.037	0.028	0.019	0.072
Silver	0.491	0.016	<0.01	<0.01
Sodium	121	85.6	77.7	136
Strontium	0.758	0.809	0.18	0.838
Sulfate	888	1290	336	1750
Thallium	0.941	0.019	<0.005	0.008
Tin	0.519	<.1	<0.1	<0.1
Titanium	0.486	<.005	<0.005	0.091
Total Dissolved Solids	3500	2160	595	2900
Vanadium	0.525	0.059	<0.007	0.089
WAD Cyanide	N/A	N/A	0.96	9.85
Zinc	0.473	0.007	0.019	0.472
Max. Potential Acidity, Ton/1000 Ton	16.25	39.4	17.2	31.6
Gross Neutral. Potential, Ton/1000 Ton	157	84.6	322	107
Paste pH	10.8	10.1	8.5	10.3

Note: This format is designed to provide a cumulative record of data from four consecutive sampling periods.

Appendix A2
Cortez Pit Water Quality

MONITOR ENVIRONMENTAL LABORATORY, INC.
1250 Lamoille Highway, Suite #3
P.O. Box 2725
Elko, Nevada 89801
Tel: (702) 738-0111
FAX: (702) 753-7255

CERTIFICATE OF ANALYSIS # 1497

CLIENT: Cortez Gold Mines

Cortez, NV 89821-

ATTN: Mr. Eric S. Vokt
Project: Pit Sampling

Date Samples Rec´d: 06/19/92
Lab. Group No.: 1497
Sample Matrix: Aqueous
Report Date: 07/06/92
P.O. Number:

LAB NO.	SAMPLE DATE	SAMP TIME	SAMPLE DESCRIPTION	ANALYSIS	RESULT
6133	06/15/92	1450	East End Cortez Pit	Arsenic, GFAA	0.038 ppm
				Lead, GFAA	<0.005 ppm
				Mercury, CVAA	<0.0005 ppm
				Selenium, GFAA	<0.005 ppm
				Barium, ICP	0.061 ppm
				Cadmium, ICP	<0.007 ppm
				Calcium, ICP	44.2 ppm
				Chromium, ICP	<0.010 ppm
				Copper, ICP	<0.007 ppm
				Iron, ICP	0.145 ppm
				Magnesium, ICP	18.0 ppm
				Manganese, ICP	0.005 ppm
				Potassium, ICP	11.3 ppm
				Sodium, ICP	72.8 ppm
				Zinc, ICP	<0.005 ppm
				Metals Prep. Aqueous	--- ---
				Alkalinity, Bicarbonate	225 ppm as $CaCO_3$
				Alkalinity, Total	225 ppm as $CaCO_3$
				Chloride, Titrimetric	24.8 ppm
				Cyanide, WAD	<0.005 ppm
				Fluoride	1.78 ppm
				Nitrate Nitrogen	<1.00 ppm as N
				pH	8.02 ---
				Solids, Dissolved (TDS)	434 ppm
				Sulfate	86.5 ppm
6134	06/15/92	1515	Middle Cortez Pit	Arsenic, GFAA	0.037 ppm
				Lead, GFAA	0.006 ppm
				Mercury, CVAA	<0.0005 ppm
				Selenium, GFAA	<0.005 ppm

More -- See Next Page

MONITOR ENVIRONMENTAL LABORATORY, INC.
1250 Lamoille Highway, Suite #3
P.O. Box 2725
Elko, Nevada 89801
Tel: (702) 738-0111
FAX: (702) 753-7255

CERTIFICATE OF ANALYSIS # 1497 [Continued]

CLIENT: Cortez Gold Mines

Cortez, NV 89821-

ATTN: Mr. Eric S. Vokt
Project: Pit Sampling

Date Samples Rec'd: 06/19/92
Lab. Group No.: 1497
Sample Matrix: Aqueous
Report Date: 07/06/92
P.O. Number:

LAB NO.	SAMPLE DATE	SAMP TIME	SAMPLE DESCRIPTION	ANALYSIS	RESULT
6134	06/15/92	1515	Middle Cortez Pit	Barium, ICP	0.060 ppm
				Cadmium, ICP	<0.007 ppm
				Calcium, ICP	43.1 ppm
				Chromium, ICP	<0.010 ppm
				Copper, ICP	<0.007 ppm
				Iron, ICP	0.257 ppm
				Magnesium, ICP	17.7 ppm
				Manganese, ICP	<0.003 ppm
				Potassium, ICP	11.4 ppm
				Sodium, ICP	72.4 ppm
				Zinc, ICP	<0.005 ppm
				Metals Prep. Aqueous	--- ---
				Alkalinity, Bicarbonate	228 ppm as CaCO3
				Alkalinity, Total	228 ppm as CaCO3
				Chloride, Titrimetric	27.9 ppm
				Cyanide, WAD	<0.005 ppm
				Fluoride	1.76 ppm
				Nitrate Nitrogen	<1.00 ppm as N
				pH	8.07 ---
				Solids, Dissolved (TDS)	438 ppm
				Sulfate	85.6 ppm
6135	06/15/92	1530	West End Cortez Pit	Arsenic, GFAA	0.040 ppm
				Lead, GFAA	0.007 ppm
				Mercury, CVAA	0.00138 ppm
				Selenium, GFAA	<0.005 ppm
				Barium, ICP	0.060 ppm
				Cadmium, ICP	<0.007 ppm
				Calcium, ICP	43.1 ppm
				Chromium, ICP	<0.010 ppm

More -- See Next Page

MONITOR ENVIRONMENTAL LABORATORY, INC.
1250 Lamoille Highway, Suite #3
P.O. Box 2725
Elko, Nevada 89801
Tel: (702) 738-0111
FAX: (702) 753-7255

CERTIFICATE OF ANALYSIS # 1497 [Continued]

CLIENT: Cortez Gold Mines

Cortez, NV 89821-

ATTN: Mr. Eric S. Vokt
Project: Pit Sampling

Date Samples Rec´d: 06/19/92
Lab. Group No.: 1497
Sample Matrix: Aqueous
Report Date: 07/06/92
P.O. Number:

LAB NO.	SAMPLE DATE	SAMP TIME	SAMPLE DESCRIPTION	ANALYSIS	RESULT
6135	06/15/92	1530	West End Cortez Pit	Copper, ICP	<0.007 ppm
				Iron, ICP	<0.050 ppm
				Magnesium, ICP	17.7 ppm
				Manganese, ICP	<0.003 ppm
				Potassium, ICP	11.1 ppm
				Sodium, ICP	71.4 ppm
				Zinc, ICP	0.006 ppm
				Metals Prep. Aqueous	--- ---
				Alkalinity, Bicarbonate	225 ppm as CaCO3
				Alkalinity, Total	225 ppm as CaCO3
				Chloride, Titrimetric	26.9 ppm
				Cyanide, WAD	<0.005 ppm
				Fluoride	1.76 ppm
				Nitrate Nitrogen	<1.00 ppm as N
				pH	8.13 ---
				Solids, Dissolved (TDS)	425 ppm
				Sulfate	81.9 ppm

Submitted by:

Carl R. Ray

Carl R. Ray
Laboratory Manager

APPENDIX B
GROUNDWATER MONITORING PROGRAM

MONITORING PROGRAM

Past and Present

Currently, Cortez Gold Mines has 62 (see Figure 4) monitor wells located within and around the Cortez operations. All of the monitor wells, except for monitor wells 53 and 59, monitor the properties of the upper unconfined aquifer. Monitor wells 53 and 59 monitor the properties of the lower confined aquifer. The Water Pollution Control Permit, NEV00023, currently requires 40 monitor wells (see TABLE 3) to be sampled on a quarterly basis to monitor the progress of the remediation and to monitor the integrity of the process components. During October 1991, two new monitor wells (MWP1 and MWSP) were added to the list of required monitor wells to be sampled. Monitor Wells MWP1 and MWSP were constructed in October 1991 to monitor the integrity of a new heap leach pad and a new process facility. During July 1992, an old recovery well, PB20, was converted to a monitor well.

TABLE III - MONITOR WELLS SAMPLED ON A QUARTERLY BASIS

MW1	MW12	MW23	MW39	MW44	MW49	MW57	MW62
MW2	MW13	MW24	MW40	MW45	MW50	MW58	MW65
MW4	MW15	MW25	MW41	MW46	MW51	MW59	MW66
MW8	MW21	MW37	MW42	MW47	MW52	MW60	MWSP
MW9	MW22	MW38	MW43	MW48	MW56	MW61	MWP1

Future

Cortez Gold Mines is presently planning to construct a new tailings pond (Tailings Pond 7) directly to the east of Tailings Pond 6. Tailings Pond 7 would be approximately

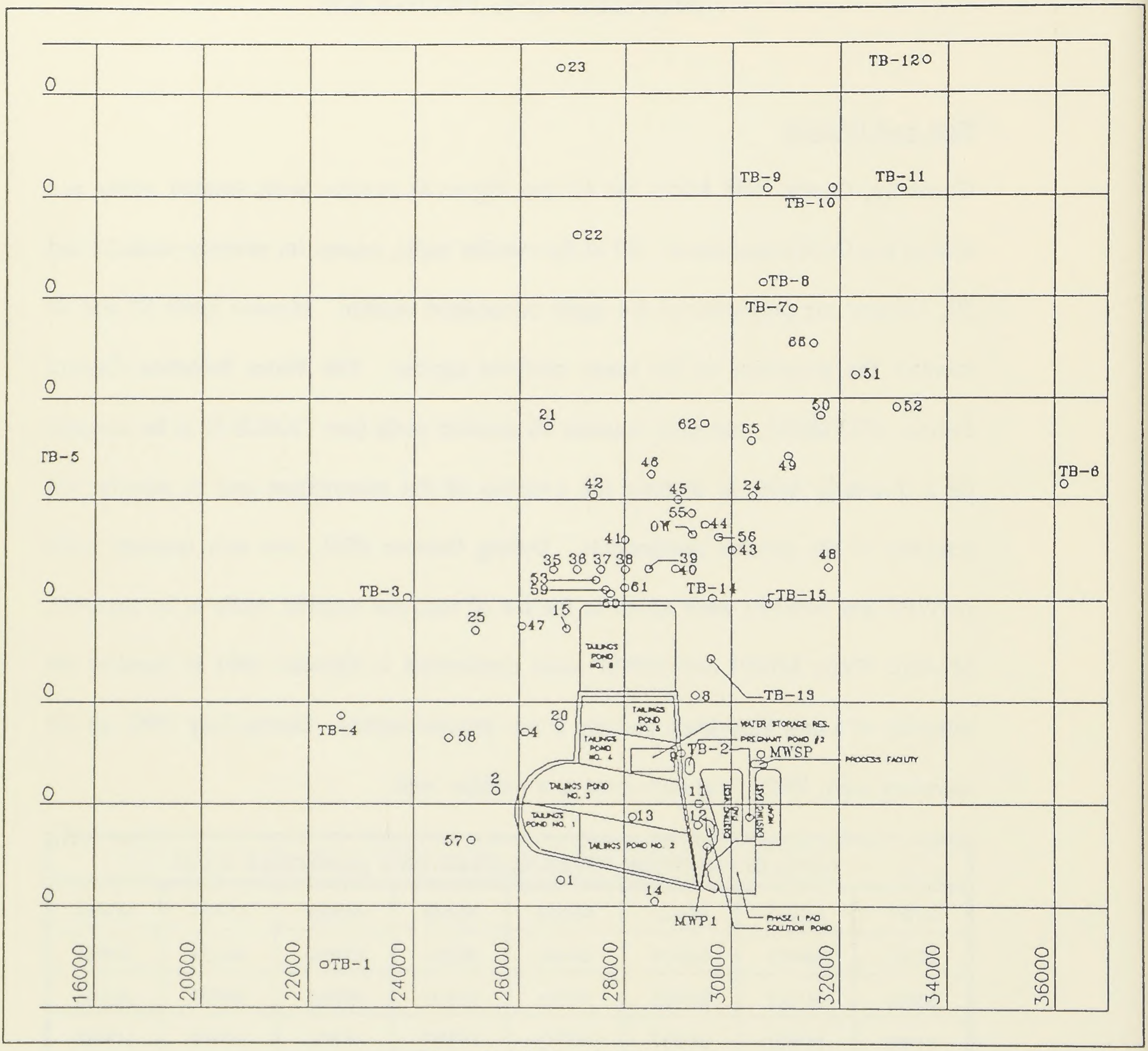

023
TB-12O
0
TB-9
TB-10
TB-11
022
OTB-8
TB-7O
660
O51
21
620
55
50
O52
TB-5
46
49
TB-6
42
45
24
550
OW
O44
41
56
43
48
35
36
37
38
39
40
53
59
61
TB-14
TB-15
TB-3
25
15
047
60
TAILINGS POND NO. 6
TB-13
08
TB-4
20
TAILINGS POND NO. 5
WATER STORAGE RES.
PREGNANT POND #2
O58
O4
TAILINGS POND NO. 4
9
TB-2
MWSP
PROCESS FACILITY
2
TAILINGS POND NO. 3
11
EXISTING WEST PAD
EXISTING EAST PAD
TAILINGS POND NO. 1
O13
12
570
TAILINGS POND NO. 2
O1
14
MWP1
PHASE I PAD
SOLUTION POND
16000
20000
22000
OTB-1
24000
26000
28000
30000
32000
34000
36000

Figure 4 - Monitor Well Locations.

the same size as Tailings Pond 6. Three existing monitor wells (8, TB-13, TB-15) will be possibly eliminated due to the construction of Tailings Pond 7. Three monitor wells

(80, 81, and 82) are proposed to replace monitor wells 8, TB-13, and TB-15 (see Figure 5). Monitor wells 80, 81, and 82 would be used to monitor background water quality and to monitor the integrity of Tailings Pond 7. In addition, five new monitor wells (73, 74, 75, 76, and 77) are proposed for an area directly to the east of the existing east heap leach pad (see Figure 6). Monitor wells 73, 74, 75, 76, and 77 would be used to obtain background ground water information; and they would also be used to assess the integrity of the future phases of the heap leach pad. Finally, three monitor wells (78, 79, and 83) are proposed to be constructed in areas where more ground water information is desired (see Figure 7).

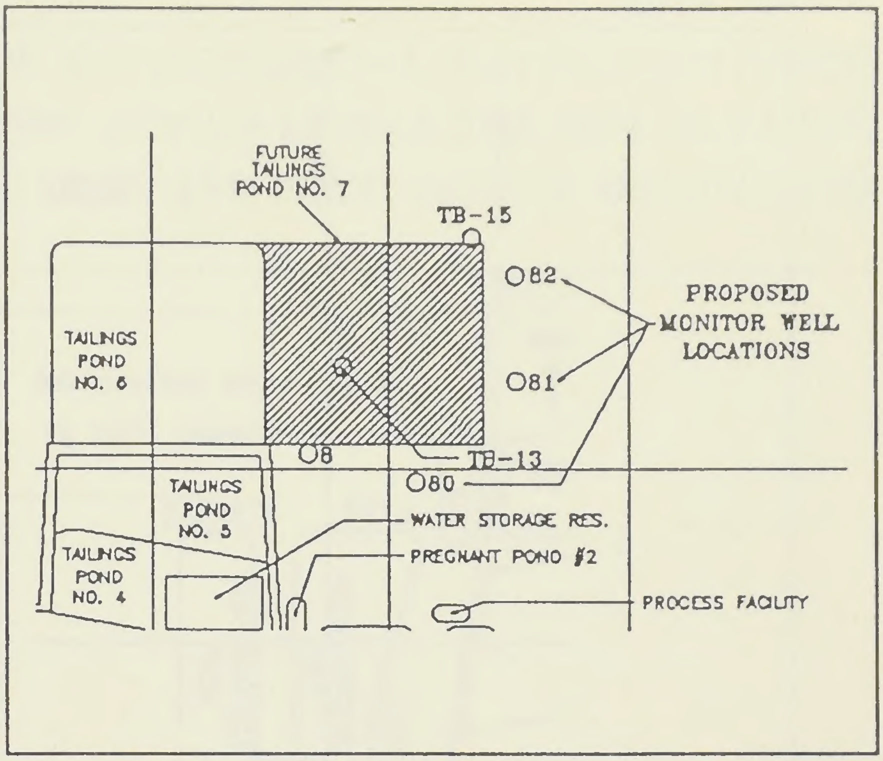

FUTURE TAILINGS POND NO. 7
TB-15
O82
O81
PROPOSED MONITOR WELL LOCATIONS
TAILINGS POND NO. 6
O8
TB-13
O80
TAILINGS POND NO. 5
TAILINGS POND NO. 4
WATER STORAGE RES.
PREGNANT POND #2
PROCESS FACILITY

Figure 5 - Proposed Monitor Well Locations for Tailings Pond 7.

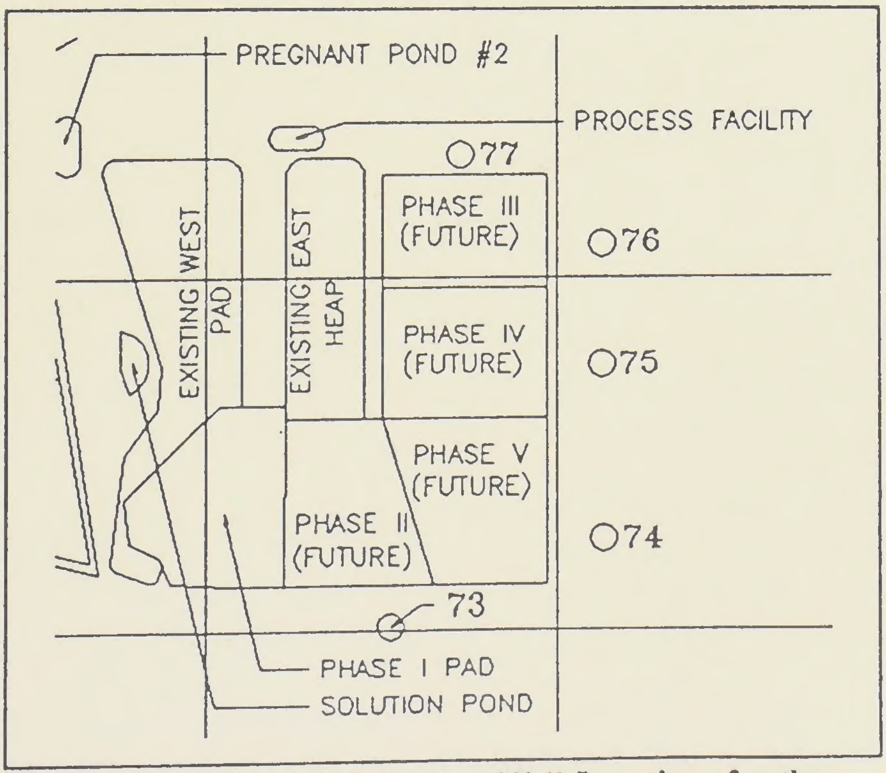

PREGNANT POND #2
PROCESS FACILITY
O77
PHASE III (FUTURE)
O76
EXISTING WEST PAD
EXISTING EAST HEAP
PHASE IV (FUTURE)
O75
PHASE V (FUTURE)
PHASE II (FUTURE)
O74
73
PHASE I PAD
SOLUTION POND

Figure 6 - Proposed Monitor Well Locations for the Future Phases of the Heap Leach Pad.

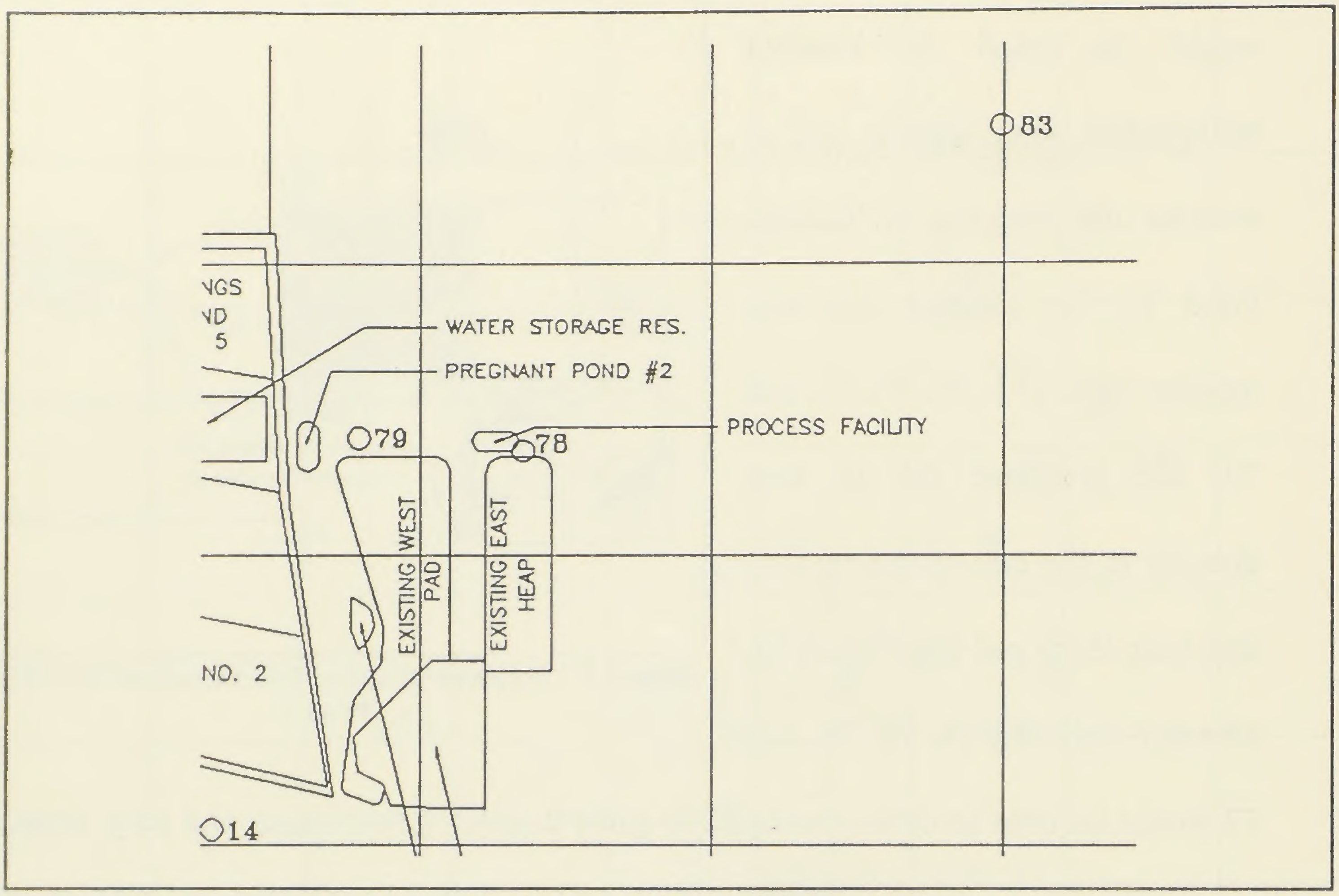

83
NGS
ND
5
WATER STORAGE RES.
PREGNANT POND #2
PROCESS FACILITY
79
78
EXISTING WEST PAD
EXISTING EAST HEAP
NO. 2
14

Figure 7 - Proposed Monitor Well Locations.

APPENDIX C

NEVADA DEPARTMENT OF ENVIRONMENTAL PROTECTION (NDEP) RESPONSES REGARDING ACTION LEVELS FOR SOIL CLEANUP, GROUNDWATER STANDARDS, AND POSTCLOSURE MONITORING

L. H. DODGION
Administrator

STATE OF NEVADA
BOB MILLER
Governor

PETER G. MORROS
Director

Administration	(702) 687-4670
Air Quality	687-5065
Mining Regulation and Reclamation	687-4675
Water Quality Planning	687-5883
Water Pollution Control	687-5870
Fax	687-5856

Waste Management	687-5872
Chemical Hazards Management	687-5872
Federal Facilities	687-5872
Fax	885-0868

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

Capitol Complex

333 W. Nye Lane

Carson City, Nevada 89710

March 25, 1993

Bill Upton
Placer Dome U.S. Inc.
459 fourth St., Suite 201
Elko, NV 89801

Re: Cortez Draft EIS Comment-Response

Dear Mr. Upton:

The following are responses to the three comments identified in your letter of 3/23/93.

Comment #1 - The 10 mg/kg action level for soil was contained in an NDEP policy document for closures which is no longer used. There are no levels established in regulation for WAD cyanide concentrations in soil. The current policy is related to the potential to degrade ground water which is based on the regulatory standard of 0.2 mg/l WAD cyanide (NAC 445.24342). Current policy is to use 10 times this standard as a general guideline for soil cleanups. Site-specific hydrologic conditions are evaluated to determine if cleanup to lower levels is warranted. There is no health risk assessment associated with this guidance policy. Our experience shows us that when a release of cyanide bearing solution occurs to soils, the soils containing cyanide are completely excavated and placed in containment, leaving no residual cyanide in the spill area or that neutralization takes place which reduces WAD cyanide concentrations to below 0.2 mg/l.

Comment #2 - Applicable ground water standards for Cortez are related to NAC 445.24342 which states that no facility may degrade ground water to the extent that the quality is lowered below a state or federal regulation prescribing a standard for drinking water. Applicable ground water standards are the primary and secondary standards (profile 1). Also included in NAC 445.24342 is the standard for WAD cyanide of 0.2 mg/l.

There are no numeric standards for surface waters at the Cortez site. NAC 445.119, which states narrative standards applicable to all waters in the State, would apply.

The basis for remediation standards is again found in NAC 445.24342 which defines degradation. Impacted ground water which originally met all standards must be remediated to the point where all standards are again met. If the impacted ground water had specific elements which exceeded standards prior to the current release, remediation standards would be either to the pre-release background level or to a higher level that would not render the water unsuitable for existing or potential municipal, industrial, domestic or agricultural use.

Comment #3 - NAC 445.24386 states that post closure monitoring may not exceed 30 years and is dependent on site-specific and process materials characteristics. Current post-closure monitoring plans consist of phased approaches to monitoring. We are currently considering five year plans with annual assessment of monitoring needs.

Please contact me if you have any questions on this matter.

Sincerely,

Doug Zimmerman

Doug Zimmerman
Branch Supervisor
Bureau of Mining Regulation
and Reclamation

DZ/sld/core.3
cc: Tom Fronapfel
Dave Davis
S. Kellogg

APPENDIX D
NEVADA DEPARTMENT OF ENVIRONMENTAL PROTECTION (NDEP) WATER POLLUTION CONTROL PERMIT

STATE OF NEVADA

Department of Conservation and Natural Resources
Division of Environmental Protection
Water Pollution Control Permit

Permittee: Cortez Gold Mines
Cortez Gold Mine
Cortez, Nevada 89821

Permit Number: NEV00023

Pursuant to Nevada Revised Statutes (NRS) 445.131 through 445.354, inclusive, and regulations promulgated thereunder by the State Environmental Commission and implemented by the Division of Environmental Protection (hereinafter the Division), this permit authorizes the Permittee to construct, operate, and close the Cortez Gold Mine in accordance with the limitations, requirements, and other conditions set forth in this permit.

The facility is located in Lander County, Township 27 North, Range 47 and 48 East, Sections 13, 14, 18 and 19.

The permittee must comply with all terms and conditions of this permit and the applicable statutes and regulations and any schedule of compliance.

This permit is based on the assumption that the information submitted in the application on April 13, 1990, as modified by subsequent approved amendments, is accurate and that the facility will be constructed and operated as specified in the application. Any inaccuracies found in this information may be grounds for revocation or modification of this permit and appropriate enforcement action. The Permittee must inform the Division of any deviation from or changes in the information in the application which may affect the Permittee's ability to comply with the applicable regulations or permit conditions.

This permit is effective as of May 14, 1991 ,and shall remain in effect until May 14, 1996, unless modified, suspended, or revoked.

Signed this 29th day of April , 1991.

Thomas J. Fronapfel

Thomas J. Fronapfel, P.E.
Bureau Chief
Bureau of Mining Regulation and Reclamation

DM/sld:**11

I. General Facility Conditions and Limitations

A. If the permittee desires to operate beyond the expiration date of this permit, he shall reapply not later than 120 days before this permit expires.

B. The provisions of this permit are severable. If any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

C. The Permittee is authorized to manage fluids and solid wastes in accordance with the conditions of this permit. Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Compliance with the terms of this permit does not constitute a defense to any order issued or any action brought under the Water Pollution Control Statutes for releases or discharges from facilities or units not regulated by this permit. NRS 445.317 provides that any person who violates a permit condition is subject to administrative or judicial action as provided in NRS 445.324 through 445.334.

D. All activities authorized herein shall be consistent with the terms and conditions of this permit. The release or discharge from the fluid management system of any constituent identified in this permit more frequently than or at a level in excess of that authorized in Section II of this permit shall constitute a violation of the permit. Any material modification must be reported by submission of a new application, or, if such changes will not violate the limitations specified in this permit, by notice to the permit issuing authority of such changes. Any change which materially modifies the permitted facility must comply with NAC 445.24284, NAC 445.24332 and NAC 445.24334.

E. All reports or other information requested by the Administrator shall be signed and certified as required by NAC 445.143.

F. Whenever the Permittee becomes aware that he failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Administrator, the Permittee shall promptly submit such facts or correct information.

G. 1. The Permittee shall at all times properly operate and maintain all facilities and systems of fluid management which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes adequate funding, adequate operator staffing and training, adequate laboratory and process controls, effective performance, and appropriate quality assurance procedures.

2. When ordered consistent with Nevada Statutes, the Permittee shall furnish any relevant information in order to determine whether cause exists for modifying, revoking and reissuing, or revoking this permit, or to determine compliance with this permit.

3. The Permittee shall allow authorized representatives of the Division, upon the presentation of credentials to:

    a. Enter at reasonable times upon the Permittee's premises where a regulated activity is located or conducted, or where records must be kept under the conditions of this permit;

    b. Have access to and copy, at reasonable times, any record that must be kept under the conditions of this permit;

    c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

    d. Sample or monitor for any substance or parameter at any location for the purposes of assuring permit and regulatory compliance.

4. The Permittee shall maintain a copy of, and all modifications to, this permit at the permitted facilities at all times.

H. 1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

2. Test procedures for the analyses of the constituents shall conform to Federal Regulations (40 CFR Part 136) or as stipulated in Part II of this permit.

3. For each measurement or sample taken pursuant to the conditions of this permit, the Permittee shall record the following information:

a. The exact place, date, and time of inspection, observation, measurement, or sampling;

b. The person(s) who inspected, observed, measured, or sampled;

c. The dates the analyses were performed and by which analytical facility;

d. The analytical techniques or methods used;

e. The results of all required analyses; and

f. The accuracy of the analytical data.

4. The Permittee is required to retain during operation, closure and reclamation all records of monitoring activities and results, including all original strip chart recordings for continuous monitoring instrumentation and all calibration and maintenance records. This period of retention must be extended during the course of any unresolved litigation.

5. Monitoring results shall be submitted quarterly. All reports are due to the Division on or before the 15th day of the month following the quarter. Reports shall be on the forms specified in Part II of this permit. Facilities which have not initiated mining or construction, must submit a status report quarterly. Subsequent to any noncompliance or any facility expansion which provides increased capacity, the Division may require an accelerated monitoring frequency.

I. 1. The Permittee must obtain a written determination from the Administrator of any planned material modification(s) as to whether or not it is considered a permit modification.

2. The permittee must notify the Division (in writing), at least thirty days before the introduction of process solutions into a new process component or into an existing process component which has been materially modified, of the intent to commence active operation of that process component.

3. The permittee must submit to the Division within thirty days after completing construction on a new process component or materially modifying an existing process component the following:

    a. As-built drawings of the process component(s);

    b. A summary of the quality control activities which were carried out during construction; and

    c. The final operating plans that reflect modifications made during construction.

4. The permittee must give advance notice to the Administrator of any planned changes or activities which are not material modifications in the permitted facility that may result in noncompliance with permit requirements.

J. The permit may be transferred to a new owner or operator only after it is modified pursuant to NAC 445.24338.

K. 1. The permittee, in accordance with NAC 445.238 through 445.241, shall notify: the Division of Emergency Management by telephone at (702) 687-4240 during normal working hours or at (702) 687-5300 after normal working hours, and the Division of Environmental Protection by phone at (800) 992-0900, extension 5872, as soon as possible after he has knowledge of a release, but not later than the end of the first working day after the release, provided:

    a. The release is a quantity equal to or greater than that which is reportable to the National Response Center pursuant to 40 CFR Part 302; or

    b. The release consists of any quantity of pollutants as defined in NRS 445.178 or hazardous waste as defined in NRS 459.430 or contaminants as defined in NRS 445.143 and the constituent is not listed in 40 CFR 302.4; or

    c. The release consists of petroleum product in a quantity greater than 25 gallons.

2. The permittee shall report to the Administrator any noncompliance with the permit.

    a. Each such event shall be reported orally not later than 5 p.m. of the next regular work day from the time the Permittee has knowledge of the circumstances. This report shall include the following:

        i. Name, address, and telephone number of the owner or operator;
        ii. Name, address, and telephone number of the facility;
        iii. Date, time, and type of incident, condition, or circumstance;
        iv. Name and quantity of materials involved;
        v. Human and animal mortality or injury;
        vi. An assessment of actual or potential hazard to human health and the environment outside the facility; and
        vii. The estimated quantity and the proposed disposition of recovered and waste material that resulted from the incident.

    b. A written summary shall be provided within 10 days of the time the Permittee makes the oral report. The written summary shall contain a description of the release or discharge and its cause, the periods of the release or discharge (including exact dates and times), whether the cause and its consequences have been corrected, and if not, the anticipated time each is expected to continue, and the steps taken or planned to reduce, eliminate, and prevent recurrence of the event.

    c. The Permittee shall take all available and reasonable actions, including more frequent and enhanced monitoring, to:

        i. Determine the effect and extent of each release or discharge;
        ii. Minimize any adverse impact to the waters of the State arising from each release or discharge;
        iii. Minimize the effect of each release or discharge upon domestic animals and all wildlife; and
        iv. Minimize the endangerment of the public health and safety which arises from each release or discharge.

L. The Permittee shall at all times maintain in good working order and operate as efficiently as possible, all devices, facilities, or systems installed or used by the Permittee to achieve compliance with the terms and conditions of this permit. The Permittee shall maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of materials to air, soil, or water which could threaten human health or the environment, and in accordance with NAC 445.170.

M. The Permittee shall construct and operate all facilities authorized by this permit in compliance with permit provisions and requirements of the Nevada Department of Wildlife's Industrial Artificial Pond Permit.

N. The Permittee shall inspect all control devices, systems and facilities, weekly or as specified in Part II. Drainage and containment systems shall also be inspected after storms and, when possible, during storms. These inspections are performed to detect evidence of:

1. Deterioration, malfunction, or improper operation of control systems;

2. Sudden changes in the level of the contents of any monitoring device;

3. The presence of liquids in leak detection systems; and

4. Severe erosion or other signs of deterioration in dikes or other containment devices.

O. The Permittee shall locate the process components in accordance with NAC 445.2436.3.

P. The Permittee shall achieve compliance with the conditions, limitations, and requirements of the permit upon commencement of each relevant activity. The Administrator may, upon the request of the permittee and after public notice, revise or modify a schedule of compliance in an issued permit if he determines good and valid cause (such as an act of God, a strike, materials shortage or other event over which the Permittee has little or no control) exists for such revision.

Q. All solid, toxic or hazardous waste shall be disposed pursuant to applicable laws and regulations.

R. The entire facility must withstand without damage, the flood or flash flood arising from a storm of 24-hour, 100-year interval of recurrence.

S. The facility shall install a calibrated rain gauge which shall be monitored daily and a record of all daily accumulations of precipitation shall be maintained.

T. Except as otherwise provided in NAC 445.24344 all ponds which contain liquor or process waters on a planned basis must have a system of hydraulic liners with leakage detection/fugitive recovery beneath the primary liner as required by the approved designs.

U. Prior to the commencement of mining activities at any site within the State which are owned or operated by the permittee and not identified and characterized in the application, the permittee shall submit to the Division a report which identifies the locations of the proposed mined areas and waste disposal sites, and characterizes the potential of the materials to be removed to release pollutants. Prior to development of these areas the Division shall determine if any of these new sources will be classified as process components, and require engineered containment and permit modification.

V. Any cessation of operations of a process component which has not been defined and extends beyond 30 days shall be deemed an unplanned temporary closure. As such, procedures in accordance with Nevada Administrative Code 445.24384 shall be initiated for that process component.

II. Specific Facility Conditions and Limitations

A. In accordance with operating plans and facility design reviewed and approved by the Division the Permittee shall:

1. Construct, operate, and close the facility in accordance with those plans and design;

2. Contain within the fluid management system all process fluids including all meteoric waters which enter the system as a result of the 25-year, 24-hour storm event. Discrete releases for which boundaries and remediation procedures have been defined in the approved Emergency Response Plan shall not be considered permit violations; and

3. Not release or discharge contaminants from the fluid management system to underground waters or to preferential pathways to underground waters which have the potential to cause a drinking water standard to be exceeded or to cause an increase in the concentration of any parameter which exceeds these standards or to cause the concentration of WAD cyanide to exceed 0.2 mg/l.

B. Schedule of Compliance

1. The Permittee shall achieve compliance and complete construction in accordance with the following schedule:

    a. The permittee shall submit to the Division, within 30 days of permit issuance, a topographic map which identifies those features listed under NAC 445.2429.C. 1., 2., 3. and 4.;

    b. The permittee shall submit to the Division, within 30 days of permit issuance, a meteorological report in accordance with NAC 445.24292.1, 2. and 3; and

    c. The permittee shall submit to the Division, within 180 days of permit issuance:

        1. Verification of the integrity of each process component;

2. Verification that each process component can be monitored by a site monitoring method, if not by leak detection;

3. A proposal to the Division that demonstrates an effective monitoring system for all process components not effectively monitored presently; and

d. The permittee shall submit to the Division, within 120 days of permit issuance a report that demonstrates:

1. The effectiveness of the monitoring wells in relation to the extent of the plume;

2. The effectiveness of the pumpback system on the plume and a proposed time schedule for remediation;

3. An evaluation of the need to modify the monitoring program as remediation progresses; and

4. The report shall include concentration contour maps for plume elements including, but not limited to, WAD cyanide, chloride and arsenic.

e. The permittee shall submit to the Division, within 120 days of permit issuance, the operating plans specified in NAC 445.24296.

C. The fluid management system consists of the following components:

1. Lined heap leach pads;

2. Pregnant, barren, pumpback, scale and storage ponds, and their liners and leak detection systems;

3. Transfer pipes, valves, and pumps used in conveyance, control or detection of process fluids between process components;

4. Process recovery building including, but not limited to all tanks, basins, sumps, pumps and piping necessary to interconnect the components within the building; and

5. The tailings impoundments including, but not limited to, the decant water, liners, pumps, and pipes.

D. Monitoring Requirements (locations shown on attachment 1 site map)

Identification	Parameter	Frequency
1) Monitoring Wells (MW)*	Profile I	Quarterly until monitoring program approved
2) Pregnant Pond 2, Pump back pond, and storage pond leak detection sumps: (PP-2, PBP, SP) Cap. (160, 160 gal, & 7.3 gal.)	Average daily accumulation in gpd	Weekly**
3) Wasterock/Overburden generated during the quarter (WR/O)	Meteoric Water Mobility Analysis Acid generation-acid neutralization potential	Quarterly
4) Pregnant, scale, pumpback, storage, and barren leach fluids	Profile II	Quarterly
5) Tailings Solution (TW)	Profile II	Quarterly
6) Tailings Solids (TS)	Meteoric Water Mobility Analysis	Quarterly
7) Reclaim Solution (RW)	Profile II	Quarterly

8)	Treated pumpback water for dust control	WAD cyanide and Profile I as per II.I	In accordance with II.I

The Permittee may request a reduction in the number of elements and frequency of analyses after one year of complete monitoring based on justification other than cost.

‡‡The sump volume must be inspected and evacuated on a more frequent basis than weekly if the volume of fluid extracted is equal to or exceeds the capacity specified in part II.D.2. Fluid in monitoring sumps shall not rise above the top of the sump or the invert of any pipe which discharges into the sump, whichever is less. Records are required documenting the volume and date and time of extraction to show that sumps are maintained in this condition.

*

MW1
MW2
MW4
MW8
MW9
MW12
MW13
MW15
MW21
MW22
MW23
MW24
MW25
MW38
MW39
MW40
MW43
MW44
MW45
MW46
MW47
MW48
MW49
MW50
MW51
MW52
MW56
MW57
MW58
MW59
MW60
MW61
MW62
MW65
MW66
MW37
MW41
MW42

E. Reporting Requirements

1. The Permittee shall submit quarterly reports which contain the following:

   a. Analytical results of water quality samples collected from monitoring wells (MW) listed above, as identified in Part II.D.1, reported on NDEP Form #0290;

   b. Monitoring results from all leak detection systems as identified in Part II.D.2 on NDEP Form #0590;

   c. A synopsis of any changes, and resultant progress being made as specified in II.B.1.d;

   d. Analytical results of wasterock/overburden as specified in Part II.D.3;

e. Analytical results of the pregnant, scale, pumpback, storage, and barren leach solutions as specified in Part II.D.4;

f. Analytical results of tailings solids, tailings solutions and reclaim water as specified in II.D.5., 6. and 7.;

g. A record of spills and releases within the built facility boundary and the remedial actions taken in accordance with the approved emergency response plan on NDEP Form #0490; and

h. If the sump capacities specified in Part II.D.2 are exceeded, records documenting that sumps are evacuated on a more frequent basis.

i. Analytical results in accordance with II.I.

2. The Permittee shall submit an annual report by January 15th of each year which contains the following:

a. A synopsis of spills and releases on NDEP Form #0390;

b. A brief summary of site operations, construction and expansion activities and major problems with the fluid management system; and

c. An evaluation of waste rock, overburden and spent ore analyses with respect to stabilization and closure.

F. Permit Limitations: The following are permit violations and shall be reported as specified in Part I.K.2:

1. The daily accumulation of flow averaged over the quarter in any one solution pond monitoring sump exceeding 150 gpd;

2. The daily accumulation of flow averaged over the year in any one solution pond monitoring sump exceeding 50 gpd;

3. Discharging into the tailings impoundment any discharge other than beneficiation waste, or a waste approved by the Division;

4. A release to waters of the State or a release outside the built facility boundary as defined in the approved Emergency Response Plan;

5. Failure to meet a compliance date; and

6. Failure to control and remediate groundwater contamination.

7. Discharge of remediation pumpback water containing greater than 0.2 mg/l WAD cyanide.

G. Acid Generation Potential

1. When static evaluations show the potential for acid generation as setforth in the Division's waste rock and overburden evaluation guidance dated 9/14/90, the permittee shall notify the Division and initiate confirmatory kinetic testing within ten days.

2. If the kinetic tests indicate acid generation conditions exist, the permittee shall submit within thirty days the methods proposed for providing containment of these materials and the impact acid generation has on final stabilization of all facility components as defined in NAC 445.24218.

H. Analytical Profiles

1. Profile I

- Alkalinity (as $CaCO_3$)
  - Bicarbonate
  - Total
- Arsenic
- Barium
- Cadmium
- Calcium
- Chloride
- Chromium
- Copper
- Fluoride
- Iron
- Lead
- Magnesium
- Manganese
- Mercury
- Nitrate
- pH (± 0.1 units)
- Potassium
- Selenium
- Silver
- Sodium
- Sulfate
- Total Dissolved Solids
- WAD Cyanide
- Zinc

2. Profile II shall consist of at least the following constituents:

Alkalinity
Aluminum
Antimony
Arsenic
Barium
Beryllium
Bismuth
Cadmium
Calcium
Chloride
Chromium
Cobalt
Copper
Fluoride
Gallium
Iron
Lanthanum
Lead
Lithium
Magnesium
Manganese
Mercury
Molybdenum
Nickel
Nitrate
pH (± 0.1 units)
Phosphorus
Potassium
Scandium
Selenium
Silver
Sodium
Strontium
Sulfate
Thallium
Tin
Titanium
Total Dissolved Solids
Vanadium
WAD Cyanide
Zinc

3. Analytical accuracy

a. The accuracy of results for Profile I, unless otherwise specified, shall be expressed in mg/L and reliable to at least two significant digits. The analytical methods used must have a lower level of detection equal to or less than one-half the MCL.

b. In Profile II, elements that have established standards shall have a level of quantification equal to or less than the standard.

I. The permittee is authorized to dispose of water from the remediation pumpback system for dust control on roads within the active mine site. The water must be treated, prior to disposal, to achieve a WAD cyanide level less than or equal to 0.2 mg/l. Analysis of treated water for WAD cyanide shall be weekly for the first quarter following permit issuance, and monthly thereafter. In addition to WAD cyanide analysis, Profile I constituents shall be analyzed for quarterly.

********************************END********************************

NDEP Form 0290

Sample Location _____	Standards (mg/l)*				
Depth to Water	Feet				
Sampling Date	–				
pH *(units)	6.5 - 8.5				
Total Dissolved Solids	500 - 1000				
WAD Cyanide	.2				
Alkalinity (Total/HCO$_3$)	–				
Calcium	–				
Magnesium	125 - 150				
Potassium	–				
Sodium	–				
Chloride	250 - 400				
Fluoride	2				
Nitrate as N	10				
Sulfate	250				
Arsenic	.05				
Barium	1.0				
Cadmium	.01				
Chromium	.05				
Copper	1.0				
Iron	.3 - .6				
Lead	.05				
Manganese	.05 - .10				
Mercury	.002				
Selenium	.01				
Silver	.05				
Zinc	5.0				

Note: This format is designed to provide a cumulative record of data from four consecutive sampling periods.

NDEP Form 0390

ANNUAL SPILL RECORD

DATE	MATERIAL SPILLED	QUANTITY AND CONCENTRATION	LOCATION OF SPILL	REASON FOR SPILL

NDEP Form 0490

SPILL/RELEASE RECORD MINE SITE ______________________

1. Date and Time of Spill:

2. Material Spilled:

3. Quantity and Concentration of Spill:

4. Location of Spill:

5. Reason for Spill:

6. Material Contaminated:

7. Remedial Actions taken in Response to Spill:
(attach analytical results supporting remediation)

8. Date Remedial Actions Completed:

9. Name of Person Responsible for Spill Remediation:

10. Position:

11. Signature: ______________________________________

12. Date:

NDEP Form 0590

LEAK DETECTION SYSTEMS - MONITORING RESULTS

onitoring ocation	Permit limit for daily average flow* during quarter	Average Daily flow* 1st Quarter 19__	Average Daily flow* 2nd Quarter 19__	Average Daily flow* 3rd Quarter 19__	Average Daily flow* 4th Quarter 19__	Yearly average flow*	Permit Limit yearly flow*

OR SUMPS REPORT DAILY ACCUMULATION RATE

FACT SHEET
(pursuant to Nevada Administrative Code 445.24308)

Permittee Name:	Cortez Gold Mines Cortez Gold Mine
Permit Number:	NEV00023

A. Description of Discharge

Location: Sections 13, 14, 18 and 19, Township 27N, Range 47 and 48E, approximately 78 miles southwest of Elko in Lander County, Nevada.

Characteristics: The project is open pit mining with ore processed by carbon-in-leach and conventional heap leach cyanidation, with precious metal recovery by carbon adsorption and electrowinning. Tailings are deposited in one of six tailings impoundments. The facility is required to design, construct, operate, and close without any release or discharge from the fluid management system except for meteorological events which exceed the design storm event.

B. Synopsis

The Cortez Facility includes open pit mining, 2 heap leach pads, 6 tailings impoundments, 2 pregnant ponds, 1 barren solution pond, 1 pumpback pond, 1 water storage reservoir, 1 scale pond, a circulating fluid bed roaster, and a processing plant. The heap leach pads cover approximately 54 acres with a future expansion of an additional pad added within the next 2 years. Compacted clay beneath the heap leach pads has a permeability of 1 x 10^{-7} cm/sec, compacted to 95% of optimum density in three 6 inch lifts. The clay is overlain with 6 inches of gravel for drainage of process fluids. Drainage of process fluids is conducted from the leach pads by either 60 mil HDPE or 40 mil hypalon-lined ditches, and flows to either pregnant pond 2 or 3. Both ditches have a compacted clay secondary containment, which is an extension of the pad clay liner.

All of the ponds are constructed on 18 inches of compacted clay-silt with a 60 mil HDPE primary liner. Pregnant pond 2 and the pumpback pond have leak detection, the remaining 3 ponds do not have leak detection. Leak detection in the pumpback pond and pregnant pond 2 consists of a 4 inch perforated pipe, buried in a clay lined trench in the center of each pond. The pipe is covered with gravel for drainage and leads to a vertical 4 inch solid pipe which penetrates the liner and rises to a platform (reclaim tower) from which visual inspection of leaks can be made.

There are 6 tailings storage impoundments at the facility only one of which is presently operational. Tailings ponds 1, 2 and 3 were formed by the deposition of tailings from 1969 to 1970 within the primary embankment. A cellular arrangement was made in 1970 and deposits continued on this basis until 1973. Tailings pond 4 is adjacent to 1, 2 and 3 and was used from 1973 to 1976. A bentonite mixture was used in the base of this impoundment to retard seepage. Impoundment 5 is adjacent to number 4 and has a compacted native clay-silt base. It was built in 1980 and operated until 1985. None of the above impoundments is presently being used.

Within tailings impoundment 4 and 5 a water storage reservoir was constructed in 1990 - 1991. This reservoir receives pumpback water from the pumpback pond below tailings dam 6. The reservoir is constructed of a prepared subgrade, with a 40 mil VLDPE secondary liner, a 60 mil VLDPE primary liner, and a leak detection geonet between the liners. The reservoir is divided by an embankment which produces 2 pond areas, each with leak detection and sumps. The sumps are gravel filled with a perforated 4 inch HDPE pipe at the bottom. The 4 inch HDPE pipe leads to a 6 inch vertical HDPE pipe as a solid pipe. The vertical pipe extends to the surface for inspection.

Tailings impoundment 6 is the only impoundment presently being used. This impoundment is in series with impoundments 1-5 and is adjacent to number 5 on the north side. Tailings impoundment 6 was constructed in 1984, and was designed to hold 2,700 acre feet with a maximum surface area of 71 acres. The impoundment will be increased in depth and volume by a raise in dam height permitted in three staged raises of 8, 7 and 6 feet respectively. The decant supernatant is pumped to the barren solution pond as the solid portion settles in the impoundment. The base of the impoundment was stripped and overexcavated to 12 inches. The soils were scarified to an 8 inch minimum, moisture conditioned to 2-4 percent over optimum moisture content, and compacted to 90 percent relative compaction. The overexcavated soils were placed in lifts not exceeding 8 inches (loose), moisture conditioned, and compacted to 90 percent relative compaction to a depth of 12 inches. The tailings pond core was constructed of compacted tailings from tailings ponds 1, 2 and 3, placed in 8 inch lifts and compacted to 90 percent relative compaction. Wasterock was placed upstream and downstream in 24 inch lifts and compacted. At the base of the embankment is a lined (60 mil HDPE) seepage ditch. The seepage ditch leads to a HDPE lined sump at the north end of the pond; from which, fluid is pumped to the pumpback pond.

A new tailings impoundment has been proposed, along with a future heap leach pad. These items will be considered at a later date through facility modification applications.

This facility is presently undergoing studies related to groundwater contamination. A formal groundwater monitoring program was established in 1981 and groundwater pollution control efforts began in 1982. Potential cyanide sources include pregnant ponds, heap leach pads, and tailings impoundments. A pumpback system was established for remediation; however, attempts to remediate adverse affects on groundwater by pumping have thus far not proven completely successful. A program to assess and improve the effectiveness of the remediation system is underway. Disposal of pumpback water for dust control is authorized by the permit. Alternative disposal measures such as injection and infiltration are presently being considered. These disposal options would require a water pollution control permit. Monitoring of the disposal activity would be controlled by the disposal permit.

The drainages around the facility and all ditches and culverts have been designed to withstand the 100-year, 24-hour storm event. Ponds and tailings impoundments have been designed to contain the 25-year, 24-hour storm event.

C. Receiving Water Characteristics

The Cortez Mine is located at an approximate elevation of 4,800 feet msl in the southern portion of Crescent Valley, in Lander county in the northern central portion of Nevada. The facility is on the northwestern flank of the Cortez Mountains near Crescent Valley, in the Great Basin section of the Basin and Range Physiographic Province. Groundwater flows tend generally to be northwest from mountain recharge eventually discharging into valley-fill alluvium. Several small perennial surface streams exist near the project site. Most precipitation falling on the mountains travels down-slope in ephemeral streams toward the valley floor. Recharge from runoff enters the regional groundwater system as it crosses the alluvial deposits at the base of the mountains. The project site area groundwater flows are generally northwest at depths ranging from 11 to 59 feet. The water quality within the Crescent Valley area has been determined to be acceptable for domestic use.

D. Procedures for Public Comment

The Notice of the Division's intent to issue a permit authorizing the facility to locate, construct, operate, and close subject to the conditions contained within the permit, is being sent to the Elko Daily Free Press in Elko for publication. The notice is being mailed to interested persons on our mailing list (see Attachment A). (Attachment A is a mailing list.) Anyone wishing to comment on the proposed permit can do so in writing within a period of 30 days following the date of the public notice. The comment period can be extended at the discretion of the Administrator.

All written comments received during the comment period will be retained and considered in the final determination.

A public hearing on the proposed determination can be requested by the applicant, any affected State, any affected intrastate agency, the regional administrator of Region IX, or any interested agency, person or group of persons. The request must be filed within the comment period and must indicate the interest of the person filing the request and the reasons why a hearing is warranted. Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator determines to be appropriate. All public hearings must be conducted in accordance with NAC 445.24306 through NAC 445.24312. The final determination of the Administrator may be appealed within 10 days of the decision to the State Environmental Commission pursuant to NRS 445.274.

E. Proposed Determination

The Division has made the tentative determination to issue the proposed permit.

F. Proposed Effluent Limitations, Schedule of Compliance and Special Conditions

See Attachment B. (Part II of the permit)

G. Rationale for Permit Requirements

The facility is located in an area where annual evaporation is greater than annual precipitation. Therefore, it must operate under a standard of performance which authorizes no discharge(s) except for excess accumulations which are a result of a storm event beyond that required by design for containment. Concentrations of cyanide in natural waters of the region are below levels of detection. Therefore, any water tested in the site area which contains cyanide is assumed to have been contaminated by mining operation activities at the Cortez Mine facility. The leak detection systems and monitoring devices shall be monitored in accordance with permit conditions. Due to closeness of subsurface waters a higher level of containment and monitoring is necessary to ensure maintenance of water quality levels. At the present time 14 pumpback wells downgradient from impoundment 6 return groundwater to the pumpback pond, while 62 ground water monitor wells continually monitor groundwater conditions. Of the 62 monitor wells, 40 are currently analyzed monthly for cyanide.

H. Federal Migratory Bird Treaty Act

Under the Federal Migratory Bird Treaty Act, 16 U.S.C. 701-718, it is unlawful to kill migratory birds without license or permit, and no permits are issued to take migratory birds using toxic ponds. The Federal list of migratory birds (50CFR10, April 15, 1985) includes nearly every bird species found in the State of Nevada. The U.S. Fish and Wildlife Service is authorized to enforce the prevention of migratory bird mortalities at ponds and tailings impoundments. Compliance with state permits may not be adequate to ensure protection of migratory birds for compliance with provisions of Federal statutes to protect wildlife. Open waters attract migratory waterfowl and other avian species. High mortality rates of birds have resulted from contact with toxic ponds at operations utilizing toxic substances. The Service is aware of two approaches that are available to prevent migratory bird mortality: 1) physical isolation of toxic water bodies through barriers (covering with netting), and 2) chemical detoxification. These approaches may be facilitated by minimizing the extent of toxic water. Methods which attempt to make uncovered ponds unattractive to wildlife are not always effective. Contact the U.S. Fish and Wildlife Service at 4600 Kietzke Lane, Building C, Reno, Nevada 89502, (702) 784-5227, for additional information.

Prepared by Dean Mierau

Date January 1991

DM/sld:**10

APPENDIX E

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT
(33 CFR 325)

OMB APPROVAL NO. 0710-0003
Expires 30 September 1992

Public reporting burden for this collection of information is estimated to average 5 hours per response for the majority of cases, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Applications for larger or more complex projects, or those in ecologically sensitive areas, could take up to 500 hours. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service, Directorate for Information Operations and Projects, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. Please DO NOT RETURN your completed form to either of these addresses. Completed application must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act and Section 103 of the Marine, Protection, Research and Sanctuaries Act. These laws require permits authorizing activities in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Information provided on this form will be used in evaluating the application for a permit. Information in this application is made a matter of public record through issuance of a public notice. Disclosure of the information requested is voluntary; however, the data requested are necessary in order to communicate with the applicant and to evaluate the permit application. If necessary information is not provided, the permit application cannot be processed nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

1. APPLICATION NUMBER (To be assigned by Corps)

2. NAME AND ADDRESS OF APPLICANT

Art Walsh - Mine Manager
Cortez Gold Mines
Star Route HC, 66-50
Beowawe, NV 89821-9708

Telephone no. during business hours

A/C ( ) ________ (Residence)
A/C (702) 468-0505 (Office)

3. NAME, ADDRESS, AND TITLE OF AUTHORIZED AGENT

Paul West
JBR Consultants Group
8160 South Highland Drive, Suite A-4
Sandy, Utah 84093

Telephone no. during business hours

A/C ( ) ________ (Residence)
A/C (801) 943-4144 (Office)

Statement of Authorization: I hereby designate and authorize Paul W. West to act in my behalf as my agent in the processing of this permit application and to furnish, upon request, supplemental information in support of the application.

SIGNATURE OF APPLICANT

DATE 10/6/92

4. DETAILED DESCRIPTION OF PROPOSED ACTIVITY

4a. ACTIVITY

See Addendum

4b. PURPOSE

See Addendum

4c. DISCHARGE OF DREDGED OR FILL MATERIAL

See Addendum

5. NAMES AND ADDRESSES OF ADJOINING PROPERTY OWNERS, LESSEES, ETC., WHOSE PROPERTY ALSO ADJOINS THE WATERWAY

U.S. Department of the Interior
Bureau of Land Management
Battle Mountain District
P.O. Box 1420
North 2nd and Scott Streets
Battle Mountain, Nevada 89820

Phone: (702) 635-5181

6. WATERBODY AND LOCATION ON WATERBODY WHERE ACTIVITY EXISTS OR IS PROPOSED

See Addendum

Sec.	Twp.	Range
	See Addendum	

Tax Assessors Description:

Map No.	Subdiv No.	Lot No.
N/A	N/A	N/A

7. LOCATION ON LAND WHERE ACTIVITY EXISTS OR IS PROPOSED

ADDRESS:

See Addendum

STREET, ROAD, ROUTE OR OTHER DESCRIPTIVE LOCATION

COUNTY	STATE	ZIP CODE
See Addendum	Nevada	89821

See Addendum

LOCAL GOVERNING BODY WITH JURISDICTION OVERSITE

8. Is any portion of the activity for which authorization is sought now complete? ☐ YES ☒ NO

If answer is "yes" give reasons, month and year the activity was completed. Indicate the existing work on the drawings.

9. List all approvals or certifications and denials received from other federal, interstate, state or local agencies for any structures, construction, discharges or other activities described in this application.

ISSUING AGENCY	TYPE APPROVAL	IDENTIFICATION NO.	DATE OF APPLICATION	DATE OF APPROVAL	DATE OF DENIAL
See Addendum					

10. Application is hereby made for a permit or permits to authorize the activities described herein. I certify that I am familiar with the information contained in the application, and that to the best of my knowledge and belief such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities or I am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE
	10/6/92	Paul W. West	10/5/92

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 3 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of The United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both.

*U.S. Government Printing Office: 1991 — 526-235/40

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT
ADDENDUM

Section 4 Detailed Description of Proposed Activity
4a Activity

Cortez Gold Mining Company proposes to place overburden and tailing material below the Ordinary High Water Mark (OHWM), at five locations in four ephemeral drainages at two of their mining claims near Crescent Valley, Nevada (Figure 1).

Fill dimensions are as follows:

Location	Length	Average Width	Average Depth	Volume	Area
Cortez Claim:					
Waste Dump	500'	34"	5"	22yds	0.03ac
Gold Acres Claim:					
East Dump	1400'	12"	8"	35yds	0.03ac
East Dump	1500'	65"	10"	251yds	0.19ac
East Dump	1100'	64"	6"	109yds	0.13ac
East Leach	400'	28"	6"	17yds	0.02ac
Sub Total				412yds	0.37ac
Total				434yds	0.40ac

4b Purpose

The proposed project is necessary for the applicant to continue development of their gold mining operation. Gold is in high demand among the public and governmental sectors.

The Gold mining industry is a major economic enterprise in Nevada, and a major employer. Cortez, with these expanded mining activities, will contribute more than $238,000 in tax revenues to two counties and more than $7,250,000 in wages to Cortez employees. This project will provide jobs for approximately 200 people.

In conjunction with these fills, normal mining facilities such as open mine pits, waste dumps, tailing piles, leach pads, and associated mine-related mills, office and storage buildings and warehouses will also be constructed on nearby locations.

Activity is scheduled to commence on or about January 1992, pending the Record of Decision by the BLM on the EIS now in progress. Record of Decision is tentatively scheduled for December 1992.

4c Discharge of Dredged or Fill Material

Approximately 434 cubic yards of mine waste rock and tailing will be placed below the OHWM at five locations in four ephemeral streams (Figures 2 and 3).

Following mining activity, all fills will be regraded and reclaimed according to State of Nevada standards.

Section 6 Waterbody and Location on Waterbody Where Activity Exists or is Proposed

Cortez Dump fill is located near an unnamed ephemeral drainage, which does not flow into a named or perennial waterway. All channels are above headwaters (see Figure 2 for the exact location).

All Gold Acres fills are located in unnamed ephemeral drainages, none of which flow into named or perennial waterways. All channels are above headwaters (see Figure 3 for exact locations).

Section 7 Location on Land Where Activity Exists or is Proposed

Legal Description

The Cortez fill is located in T26N, R47E, Sec 24, MDBM.

Gold Acres fills are located in T28N, R47E, Sec 31, and T27N, R46E, Sec 1, MDBM.

County and State

Cortez and Gold Acres are both located in Lander County, Nevada

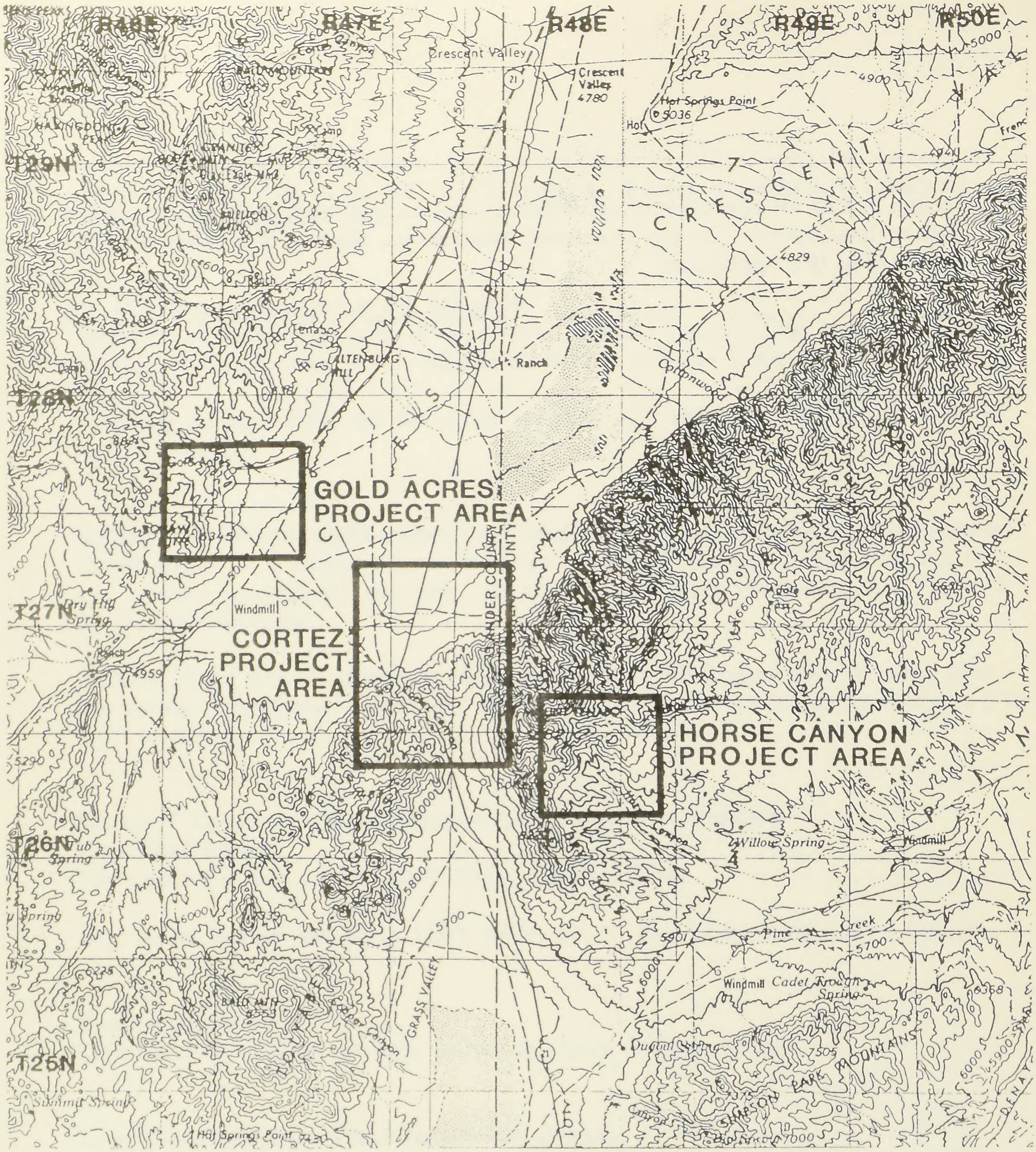
Local Governing Body with Jurisdictional Oversite

USDI Bureau of Land Management
Battle Mountain District

Lander County

Section 9 List all approvals or certifications and denials received from other federal, state or local agencies for any structures, construction, discharges or other activities described in this application.

ISSUING AGENCY	TYPE APPROVAL	IDENTIFICATION NO.	DATE OF APPLICATION	DATE OF APPROVAL	DATE OF DENIAL
None					


R46E
R47E
R48E
R49E
R50E
T29N
T28N
T27N
T26N
T25N
Crescent Valley
Crescent Valley 4780
Hot Springs Point
5036
4900
5000
4829
C R E S C E N T
Tenabo
ALTENBURG HILL
Ranch
Cottonwood
GOLD ACRES PROJECT AREA
CORTEZ PROJECT AREA
HORSE CANYON PROJECT AREA
LANDER COUNTY
Windmill
Dry Hill Spring
4959
5290
5400
6000
5800
5700
Willow Spring
Windmill
Pine Creek
5701
Windmill Cadet Trough Spring
6368
Dugout Spring
7505
SIMPSON PARK MOUNTAINS
7000
GRASS VALLEY
BALD MTN
Summit Spring
Hot Springs Point
21

SCALE 1:250,000

0 5 10 MILES

0 5 10 KILOMETERS

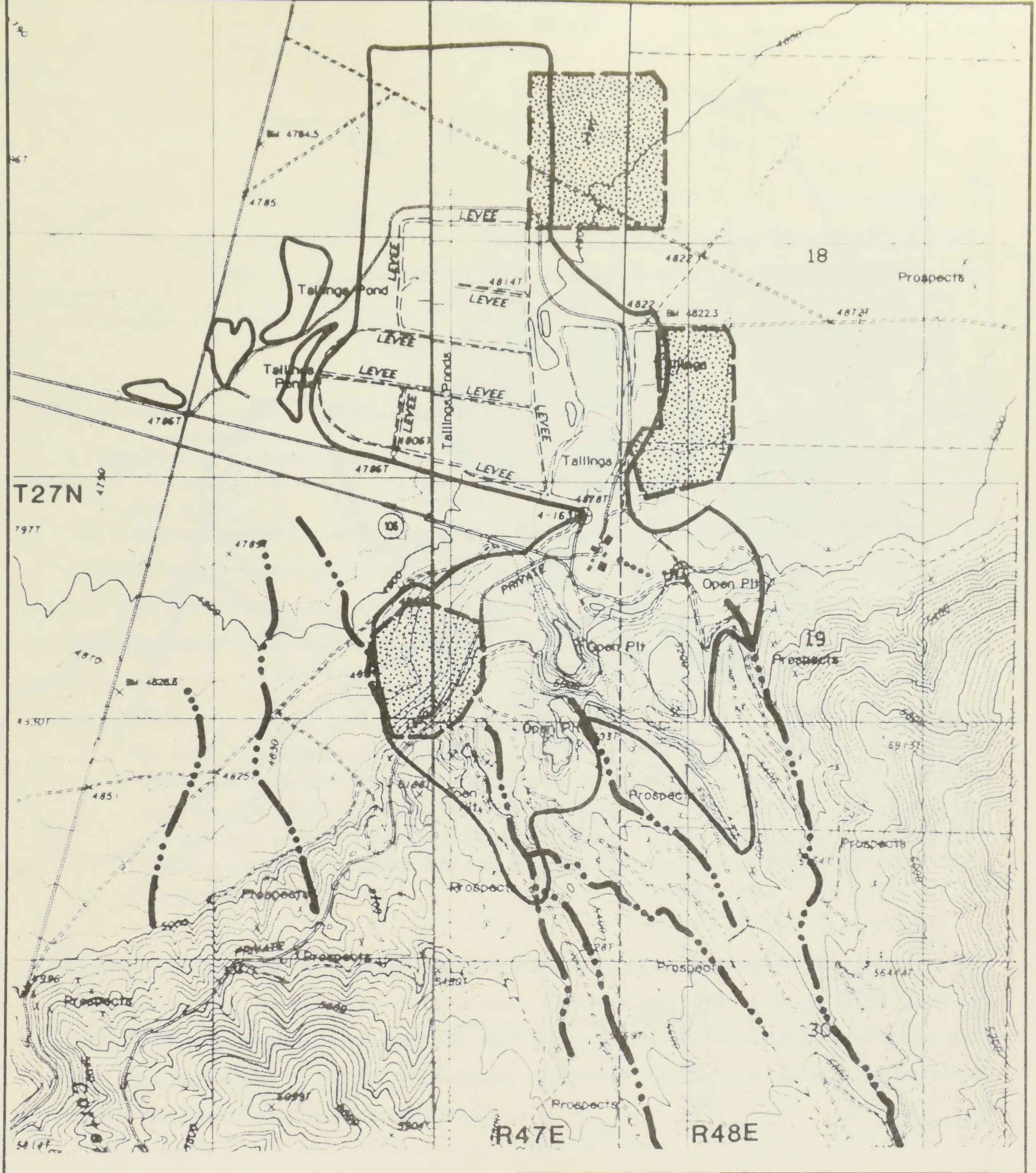
CORTEZ GOLD MINES

FIGURE 1

LOCATION MAP

JBR CONSULTANTS GROUP
SALT LAKE CITY, UTAH

6/24/91

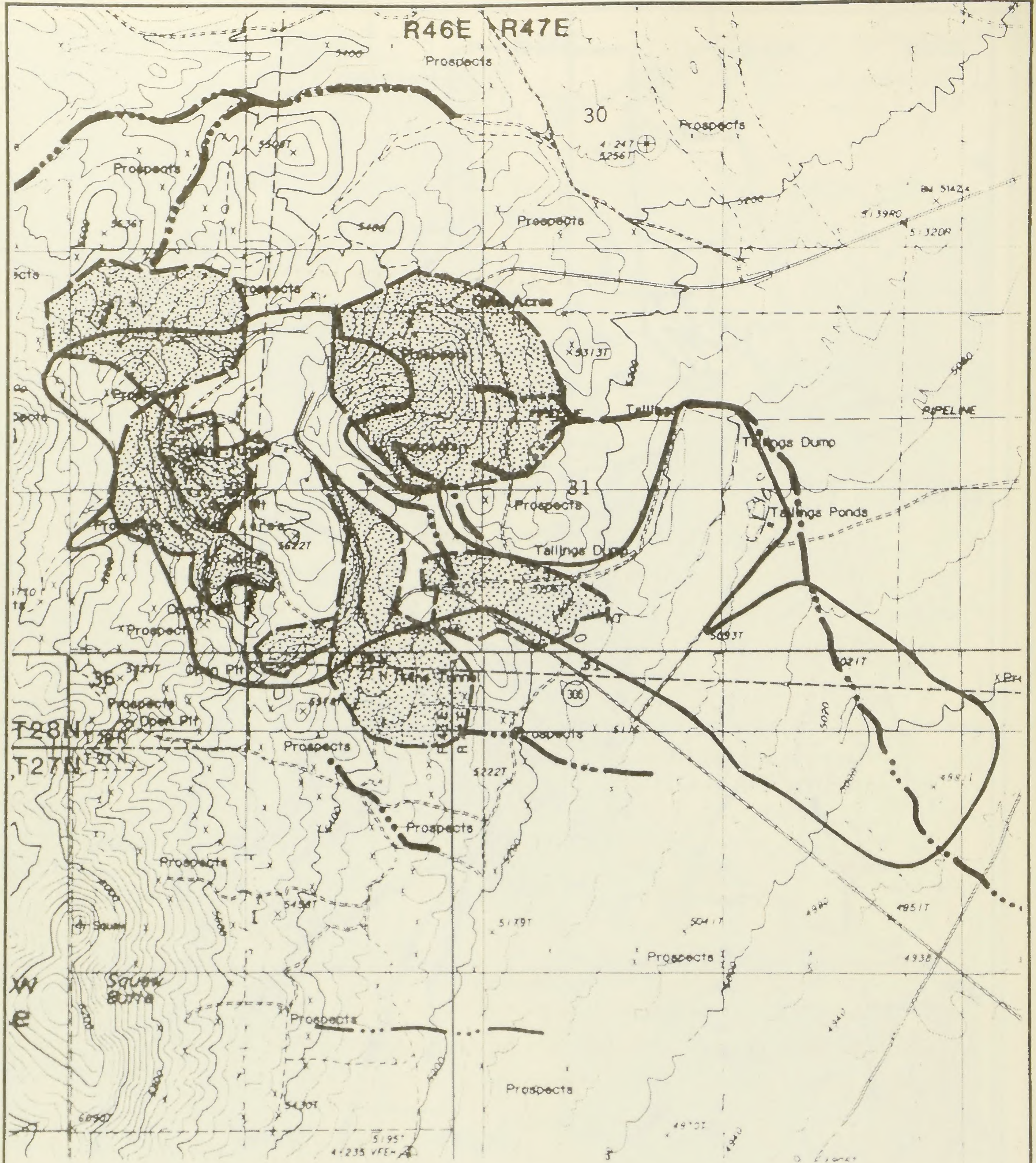

BM 4784.5
4785
LEVEE
Tailings Pond
Tailings Pond
Tailings Ponds
Tailings
Tailings
4814T
4822
BM 4822.3
4872T
18
Prospects
4786T
4806T
4786T
T27N
108
4787T
4-163
PRIVATE
Open Pit
Open Pit
Open Pit
Open Pit
19
Prospects
4789
4810
BM 4828.8
4830
4825
4851
Prospect
Prospect
Prospect
Prospects
Prospects
Prospects
Prospects
PRIVATE
5000
5913T
5644T
30
R47E
R48E
EXPLANATION
WATERS OF THE U.S.
EXISTING FILLS
PROPOSED FILLS
N
2000
0
2000 FEET

CORTEZ GOLD MINES

FIGURE 2
CORTEZ PROJECT AREA

jbr CONSULTANTS GROUP
SALT LAKE CITY, UTAH

9/25/92


R46E
R47E
Prospects
30
Prospects
Prospects
Prospects
Gold Acres
Tailings
PIPELINE
Tailings Dump
31
Prospects
Tailings Ponds
Tailings Dump
Open Pit
Open Pit
Prospects
Open Pit
Prospects
T28N
T27N
Prospects
306
Prospects
Prospects
Prospects
Prospects
Squaw Butte
Prospects
Prospects
Prospects

EXPLANATION

▬ • • • WATERS OF THE U.S.

—— EXISTING FILLS

▨ PROPOSED FILLS

2000 0 2000 FEET

N

CORTEZ GOLD MINES

FIGURE 3
GOLD ACRES PROJECT AREA

jbr CONSULTANTS GROUP

9/25/92

APPENDIX F
DRAFT REVEGETATION STANDARDS FOR NEVADA'S SURFACE MANAGEMENT PROGRAM

MINE PLANS

1. Selection of Disturbed Site Plant Community

The revegetation goal for reclaiming mining disturbance is to stabilize the site and establish a productive vegetative community based on the land use plan and designated post-mining land use. From these goals, a Disturbed Site Plant Community (DSPC) will be selected for establishment on the reclaimed mining site. The Disturbed Site Plant Community is defined as:

> A plant community established on a disturbed area which produces the kind and amount of vegetation necessary for meeting or exceeding the land use plan goals and activity plan objectives established for the site. The DSPC becomes the vegetation management objective for the site and must be consistent with the site's capability to produce desired vegetation and stability through management, land treatment, or a combination of the two.

Several DSPCs may be selected depending on the reclamation goals and variable site characteristics of the reclaimed disturbances. Consideration will be given when selecting these DSPCs to the major alterations that have taken place to the reconstructed mine site and soils, and their effect on the site potential for vegetation. DSPCs need to be selected which have a reasonable chance of establishment.

The seed list, as stipulated in the mine plan, must contain species from each of the three vegetative life forms (grasses, forbs, and shrubs). Initial seed selection can be based on the surrounding plant communities, the ecological range site descriptions, and/or various recommendations approved by the BLM and the State. Test plots or demonstration areas can be used to determine the most successful species to be used for final reclamation.

The following represent the three methods by which DSPCs would be selected:

1. Select existing vegetation types around the mine site to represent the varied DSPCs for reestablishment.

2. Use test plots or demonstration areas on the mine site or from representative areas from adjacent mines to serve as the DSPCs as long as they meet the reclamation goals.

3. For those mine sites that are in woodland communities or are in areas where the existing vegetation has been severely disturbed and the test plots are not a reasonable alternative, DSPCs may then be based on ecological or range site descriptions.

II. Release Criteria

The reclamation plan will state a goal for perennial vegetative cover. This will be 50 percent of an adjacent undisturbed area or 50 percent of the ecological or range site description cover. Test plots or demonstration areas approved by the BLM and the State may be used to determine the best method to achieve these goals of perennial vegetative cover. When using test plots to determine the DSPCs, the goal for bond release will be to attain 75 percent of the vegetative cover of the most productive test plot. In the interest of biodiversity, all three of the vegetative life forms (grasses, forbs, and shrubs) must be present in the line intercept evaluation of cover described below.

III. Data Collecting Methods

For methods 1 and 2, permanent transects would be set up to measure cover within the DSPCs (existing vegetative types or test plots). Foliar and basal cover would be determined by the line intercept method as described in the BLM Rangeland and Monitoring Technical Reference 4400-4, page 42. For method 3, cover would be determined by the ecological or range site description. Evaluation of plant cover must coincide with the active growing season.

IV. Timeframes

The BLM and State will evaluate the success of the vegetative growth of a reclaimed mine site after two full growing seasons have elapsed since earthwork and seeding have been completed. Interim progress of the revegetation will be monitored. Where it has been determined that revegetation success has not met the reclamation goal, the BLM, the State, and the mining operator will meet to decide on the best course of planned actions necessary to meet the reclamation goal.

V. Bond Release

A reclamation bond or surety (bond) may be released, either in part or in whole, at the request of the mine operator.

For reclamation plans in which revegetation is part of the plan for reclamation, partial release of the bond may be granted prior to completion of the mining project. That portion of a bond covering a discrete area of disturbance may be released when the reclamation requirements for that area have been completed. Sixty percent of the calculated bond amount may be released upon completion of earthwork. An additional 25 percent may be released after revegetation requirements have been satisfied. One hundred percent of the bond amount calculated for a discrete area may be released if no other reclamation activities (fencing, removal of fencing, signing, etc.) are proposed for the area.

When all requirements of the reclamation plan have been satisfied, including detoxification of leachates, the reclamation bond held for a particular mining operation may be released.

EXPLORATION PLANS

The same bond release criteria will hold for exploration plans with the deletion of test plots. Bond release will be based on achieving 50 percent of the cover of the surrounding vegetation or 50 percent of the ecological range site description.

NOTICES

Revegetation standards for notice-level activity will be based on the same criteria as exploration plans. However, notices may be closed as soon as reclamation is completed to the satisfaction of the authorized officer.

If earthwork reclamation and seeding have been completed on a project area, this acreage will not count in the total disturbance. This will be called monitored reclamation. The monitored reclamation will not be released until the revegetation requirements have been met as described above. The operator may create additional disturbance as long as the active unreclaimed disturbance does not exceed 5 acres and the total monitored reclamation does not exceed 10 acres.

APPENDIX G

PERTINENT AIR QUALITY DATA (TABLES 1, 2, AND 3)

TABLE 1
EMISSIONS OF CRITERIA POLLUTANTS FROM DIESEL-POWERED CONSTRUCTION EQUIPMENT

CONSTRUCTION EQUIPMENT

	Quantity	Equipment Usage (hours/month)	(hours/day)
13.5 CY LOADER	3	617	28
7.5 CY LOADER	1	120	5
5.3 CY LOADER	2	731	33
85 TON TRUCK	6	2003	91
50 TON TRUCK	4	437	20
50 TON TRACTOR/TRAILER	2	40	2
10,000 GALLON WATER TRUCK	1	190	9
12,000 GALLON WATER TRUCK	1	190	9
40,000 LB BLASTHOLE DRILL	3	791	36
AIR TRACK DRILL/COMPRESSOF	1	10	0
ANFO BLASTING TRUCK	2	70	3
TRACK DOZER	3	704	32
RUBBER TIRE DOZER	1	282	13
MOTOR GRADER	3	423	19

AP-42 VOL. II EMISSION FACTORS FOR SPECIFIC EQUIPMENT (Lb/Hr)

	CO	Hydro-Carbons	NOx	SO2	Particulate
13.5 CY LOADER	0.572	0.25	1.89	0.182	0.172
7.5 CY LOADER	0.572	0.25	1.89	0.182	0.172
5.3 CY LOADER	0.572	0.25	1.89	0.182	0.172
85 TON TRUCK	1.794	0.192	4.166	0.454	0.256
50 TON TRUCK	1.794	0.192	4.166	0.454	0.256
50 TON TRACTOR/TRAILER	3.59	0.188	1.269	0.09	0.136
10,000 GALLON WATER TRUCK	1.794	0.192	4.166	0.454	0.256
12,000 GALLON WATER TRUCK	1.794	0.192	4.166	0.454	0.256
40,000 LB BLASTHOLE DRILL	0.675	0.152	1.691	0.143	0.139
AIR TRACK DRILL/COMPRESSOR	0.675	0.152	1.691	0.143	0.139
ANFO BLASTING TRUCK	1.794	0.192	4.166	0.454	0.256
TRACK DOZER	0.201	0.098	0.827	0.076	0.058
RUBBER TIRE DOZER	1.794	0.192	4.166	0.348	0.165
MOTOR GRADER	0.151	0.04	0.713	0.086	0.061

EXHAUST EMISSIONS (Lbs/Month)

	CO	Hydro-Carbons	NOx	SO2	Particulate
13.5 CY LOADER	352.9	154.3	1166.1	112.3	106.1
7.5 CY LOADER	68.6	30.0	226.8	21.8	20.6
5.3 CY LOADER	418.1	182.8	1381.6	133.0	125.7
85 TON TRUCK	3593.4	384.6	8344.5	909.4	512.8
50 TON TRUCK	784.0	83.9	1820.5	198.4	111.9
50 TON TRACTOR/TRAILER	143.6	7.5	50.8	3.6	5.4
10,000 GALLON WATER TRUCK	340.9	36.5	791.5	86.3	48.6
12,000 GALLON WATER TRUCK	340.9	36.5	791.5	86.3	48.6
40,000 LB BLASTHOLE DRILL	533.9	120.2	1337.6	113.1	109.9
AIR TRACK DRILL/COMPRESSOF	6.8	1.5	16.9	1.4	1.4
ANFO BLASTING TRUCK	125.6	13.4	291.6	31.8	17.9
TRACK DOZER	141.5	69.0	582.2	53.5	40.8
RUBBER TIRE DOZER	505.9	54.1	1174.8	98.1	46.5
MOTOR GRADER	63.9	16.9	301.6	36.4	25.8
Total:	7419.9	1191.2	18278.1	1885.4	1222.3

EXHAUST EMISSIONS (Lbs/Day)

	CO	Hydro-Carbons	NOx	SO2	Particulate
13.5 CY LOADER	16.1	7.0	53.2	5.1	4.8
7.5 CY LOADER	3.1	1.4	10.3	1.0	0.9
5.3 CY LOADER	19.1	8.3	63.0	6.1	5.7
85 TON TRUCK	163.9	17.5	380.7	41.5	23.4
50 TON TRUCK	35.8	3.8	83.1	9.1	5.1
50 TON TRACTOR/TRAILER	6.6	0.3	2.3	0.2	0.2
10,000 GALLON WATER TRUCK	15.6	1.7	36.1	3.9	2.2
12,000 GALLON WATER TRUCK	15.6	1.7	36.1	3.9	2.2
40,000 LB BLASTHOLE DRILL	24.4	5.5	61.0	5.2	5.0
AIR TRACK DRILL/COMPRESSOR	0.3	0.1	0.8	0.1	0.1
ANFO BLASTING TRUCK	5.7	0.6	13.3	1.4	0.8
TRACK DOZER	6.5	3.1	26.6	2.4	1.9
RUBBER TIRE DOZER	23.1	2.5	53.6	4.5	2.1
MOTOR GRADER	2.9	0.8	13.8	1.7	1.2
Total:	338.5	54.3	833.9	86.0	55.8

NOTES:

1) Daily hours of operation based on a schedule of two 10 hour shifts in one day. Actual mining schedule is two 10 hour shifts, four days a week and one 10 hour shift, three days a week.

2) Emission factors obtained from AP-42, Volume II .

TABLE 2
ESTIMATES OF FUEL STORAGE, USAGE, AND EVAPORATIVE EMISSIONS

Estimated Monthly Usage (gal)			Estimated Annual Usage (gal)			Actual Total Storage Quantity (gal)		
Diesel	Unleaded Gasoline	Regular Gasoline	Diesel	Unleaded Gasoline	Regular Gasoline	Diesel	Unleaded Gasoline	Regular Gasoline
754,842	25,917	6,829	9,058,099	311,003	81,949	101,000	4,500	1,500

Storage Tanks

Diesel

Location	Quantity	Capacity (gal)	Dimensions (Diam. x Length)	Evaporative Emissions (lb/yr)
Cortez	1	27,000	12' x 32'	23.17
Gold Acres	1	10,000	8' x 27'	8.64
Gold Acres	1	8,000	8' x 21.8'	6.93
Gold Acres	1	12,000	8' x 32'	10.3
Roaster	2	21,500	12' x 30'	21.76
Well	1	1,000	3.8' x 12'	0.37

Unleaded

Location	Quantity	Capacity (gal)	Dimensions (Diam. x Length)	Evaporative Emissions (lb/yr)
Cortez	1	4,000	6.3' x 17'	1693.41
Gold Acres	1	500	3.8' x 6'	333.64

Regular

Location	Quantity	Capacity (gal)	Dimensions (Diam. x Length)	Evaporative Emissions (lb/yr)
Cortez	1	1,000	3.8' x 12'	477.19
Gold Acres	1	500	3.8' x 6'	325.12

Annual Hydrocarbon Emissions from Refueling of Diesel and Gasoline Vehicles (lb/yr)

Diesel	56.4
Gasoline	3867

Solvents

Location	Estimated Annual Usage (gal)	Quantity Stored (gal)
Cortez	605	330
Gold Acres	550	220

TABLE 3
TOXIC EMISSIONS FROM DIESEL EXHAUST a

Pollutant	% Wt.	Emissions (lb/month)
Aluminum	0.117	1.43
Silicon	0.245	2.99
Phosphorus	0.071	0.87
Chlorine	0.039	0.48
Chromium	0.002	0.02
Manganese	0.003	0.04
Iron	0.012	0.15
Nickel	0.001	0.01
Copper	0.006	0.07
Selenium	0.002	0.02
Bromine	0.005	0.06
Mercury	0.002	0.02
Lead	0.028	0.34
Formaldehyde	8.61	102.56
Acetaldehyde	2.91	34.66
Crotonaldehyde	1.01	12.03

a Estimated from particulate matter and hydrocarbon emissions, using EPA particulate and organic speciation profiles for diesel vehicles.

APPENDIX H
RESPIRATOR PROGRAM

CORTEZ GOLD MINES
RESPIRATOR PROGRAM

1. RESPIRATOR PROGRAM ADMINISTRATION

A. Respirator program administration is the responsibility of the Cortez Gold Mines' Safety Director.

2. APPROVED RESPIRATORS

A. All Cortez Gold Mines' employees will use only approved respirators. The following is a list of approved respirators.

NAME OF RESPIRATOR	APPROVED CARTRIDGE
Comfo II or Glendale F-950	MSA Organic Vapors #464031
	MSA Mersorb (Mercury) #466204
	MSA Combination Filter #464027
MSA Industrial Gas Mask	Cartridge Canister GMC-SS
3M Dust and Mist Respirators 8710	

3. RESPIRATOR ASSIGNMENTS

A. Respirator assignments shall be made in conjunction with identified hazards in each work area.

4. TRAINING

A. Each respirator wearer will receive respiratory protection training as part of their initial and annual training. The training will include all supervisors, as they must be aware of the types and limitations of respirators work by employees.

B. Respiratory protection training will consist of an explanation and discussion of the following:

(a) The respiratory hazards resulting when a respirator is not properly worn.

(b) The engineering and administrative controls being used and the need for respirators to provide protection.

(c) The reasons for selecting a particular type of respirator.

(d) The function, capabilities, and limitations of the selected respirator.

(e) The proper method of donning the respirator and checking for proper fit.

(f) Respirator maintenance.

(g) Recognition of emergency situations.

5. RESPIRATOR FIT TESTING

A. Fit testing shall be conducted in accordance with ANSI Z88.2-1980, Section 6.11.

6. FACIAL HAIR-CONTACT LENSES-EYE AND FACE PROTECTIVE DEVICES

A. All employees required to use respiratory protection will be clean shaven except for a modest mustache or sideburns which DO NOT interfere with the seal of the respirator.

B. When safety glasses, goggles, face shield, or welding helmets are worn with a respirator, they must be worn so as not to affect the seal of the respirator to the face.

7. RESPIRATOR INSPECTION

A. Respirators shall be inspected by the wearer prior to being used to insure that it is in proper working condition.

8. MONITORING RESPIRATOR USE

A. Supervision shall monitor the use of respirators to ensure they are worn properly.

9. RESPIRATOR MAINTENANCE

A. Respirators shall be maintained by the user after each daily use or more frequently if needed.

B. Maintenance shall consist of the following:

   (a) Washing, sanitizing, rinsing, and drying.

   (b) Inspection for defects.

   (c) Replacement of worn or deteriorated parts.

   (d) Storage to protect against dust, sunlight, excessive heat, excessive moisture, damaging chemicals, and physical damage in general.

10. RESPIRATOR PROGRAM EVALUATION

A. The Safety Director shall determine the effectiveness of the respirator program and shall take immediate action to correct any defects found in the program.

BLM LIBRARY
RS 150A BLDG. 50
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, CO 80225

BLM LIBRARY
RS 150A BLDG. 50
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, CO 80225

R'S CARD
93
expansion
OFFICE
DATE RETURNED
(Continued on reverse)

TN 423 .N3 B38 1993

Cortez Gold Mine expansion
project, final

BLM LIBRARY
RS 150A BLDG. 50
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, CO 80225